رؤساء اللجنة العلمية دفعة 37B:

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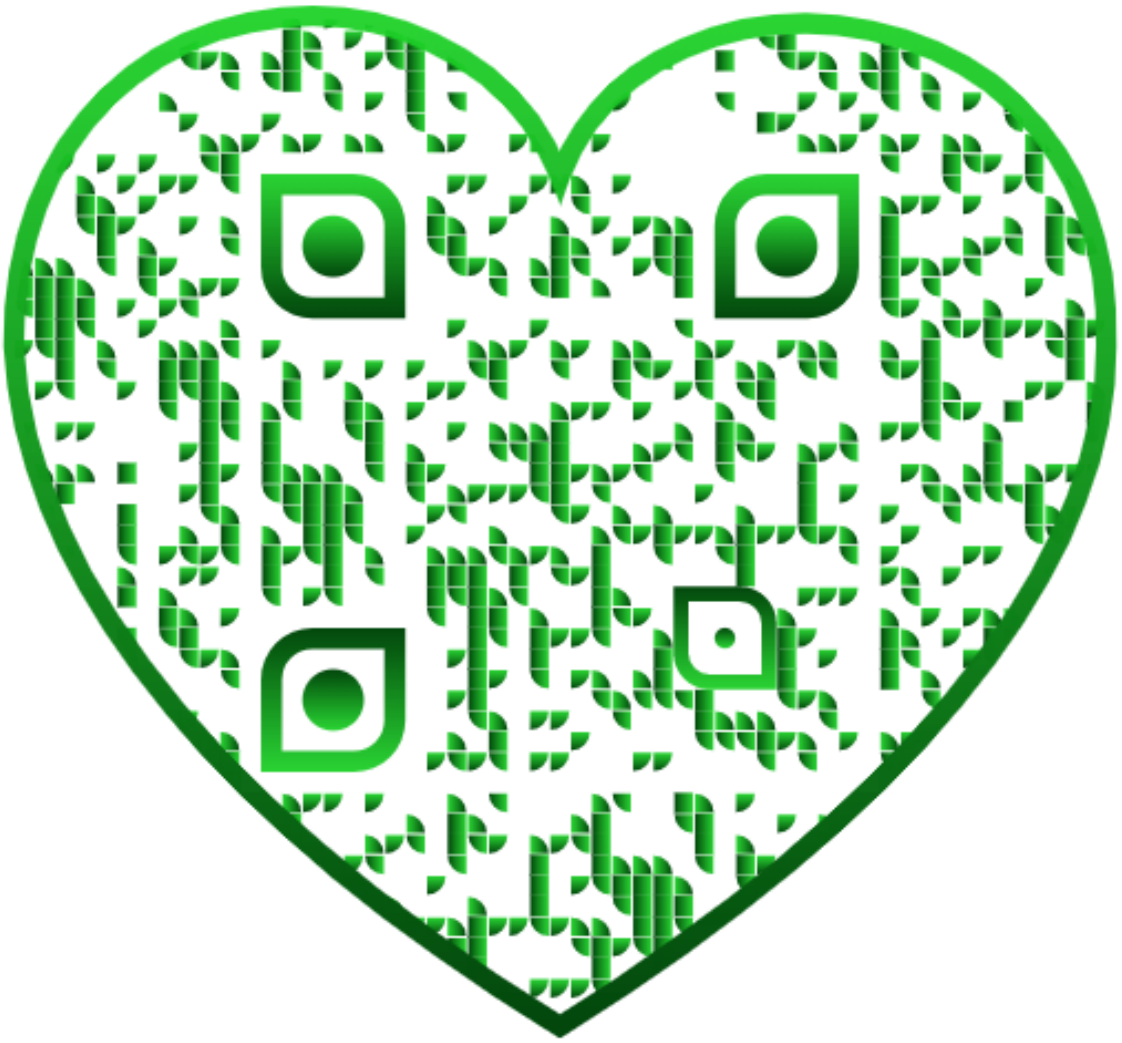

من لا يشكر الناس لا يشكر الله، وأنتم جميعا تستحقون الشكر والثناء احترقتم في الظلام لتنيروا لنا الطريق، كنتم في سباق مع الوقت سكنتم على رفوف ملازم ومراجع قسم الجلدية فلولاكم بعد الله لم تكن دائرتنا لتصل الى أفضل المراتب ولولا جهودكم لما كان للنجاح أي وصول ولما تحققت الأهداف، فأنتم أساس رفعة الدائرة، وأساس تقدمها ، وأنتم من يحمل شعلة النجاح والتطور، فشكرا لكم والى الامام دائما .

- **أسماء الأعضاء:**
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  - ✓ نور احمد الزبيدي

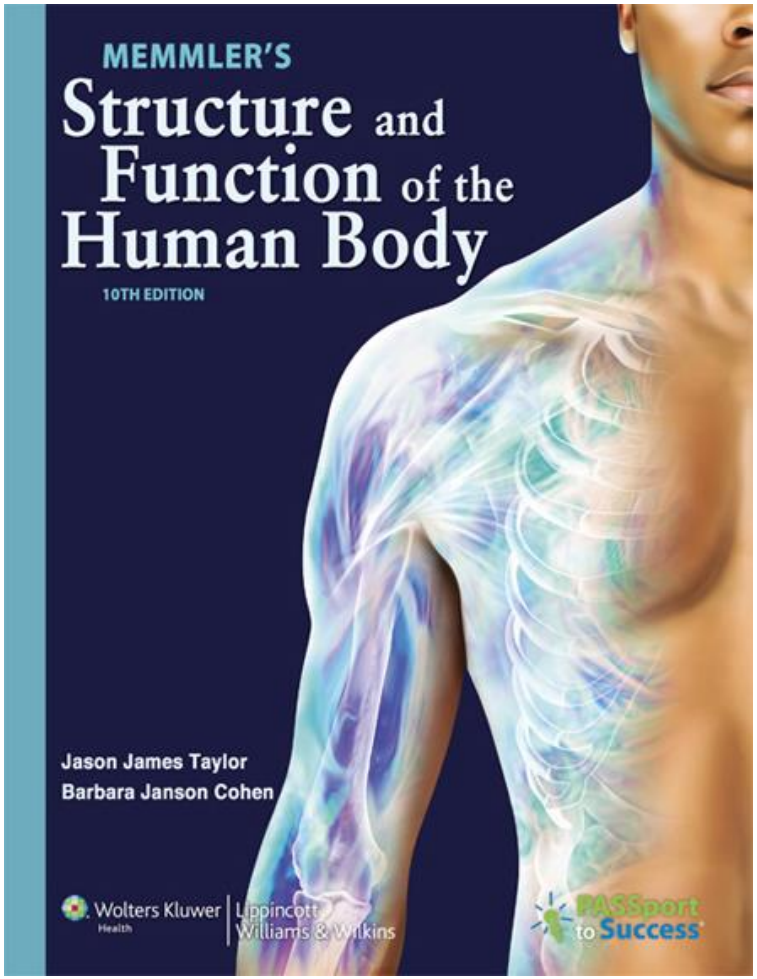
النقص فينا باقي،و الكمال بالمشاركة و التعاون؛

في حال وجود أي خطأ او تعديل ،يرجى ارساله الى بوت اللجنة العلمية:

@ScientificGroup37Bbot

تنوية

تلخيص أول محاضرة جلدية لدكتوره
بلقيس كان عباره عن اضافة
الملاحظات و النقاط الي اضافتها
الدكتوره اثناء الشرح على
السلايدات الدكتوره نفسها أي
السلايدات هي تبع الدكتوره بلقيس
كل شي مضاف مكتوب عنده Notes
و additional lecture notes



The Skin (Integumentary System)

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Dermatology

- **It is the branch of medicine dealing with**

the skin, nails, hair and its diseases. It is a specialty

with both medical and surgical aspects..

- **◉ The branch of medicine that deals with**

diagnosis and treatment of diseases and disorders of

skin. (oxford dic.)

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FACTS

- The skin is the largest organ of the body.
- ◉ Total area of about 15-20 square feet with thickness of 0.3 to 3mm.
- Accounts for 7% of body weight. It weighs twice as much as yourbrain.
- ◉ 1cm2 has 70 cm blood vessels, 55 cm nerves,100 sweat glands, 15 oil glands, 230 sensory receptors.

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Key Terms

apocrine
alopecia
arrector pili
cerumen
cicatrix
cyanosis
dermatitis
dermis
eccrine
epidermis
erythema
exfoliation
follicle
integument
jaundice
keloid
keratin
lesion
melanin
melanocyte
scar
sebaceous
sebum
stratum
subcutaneous
sudoriferous

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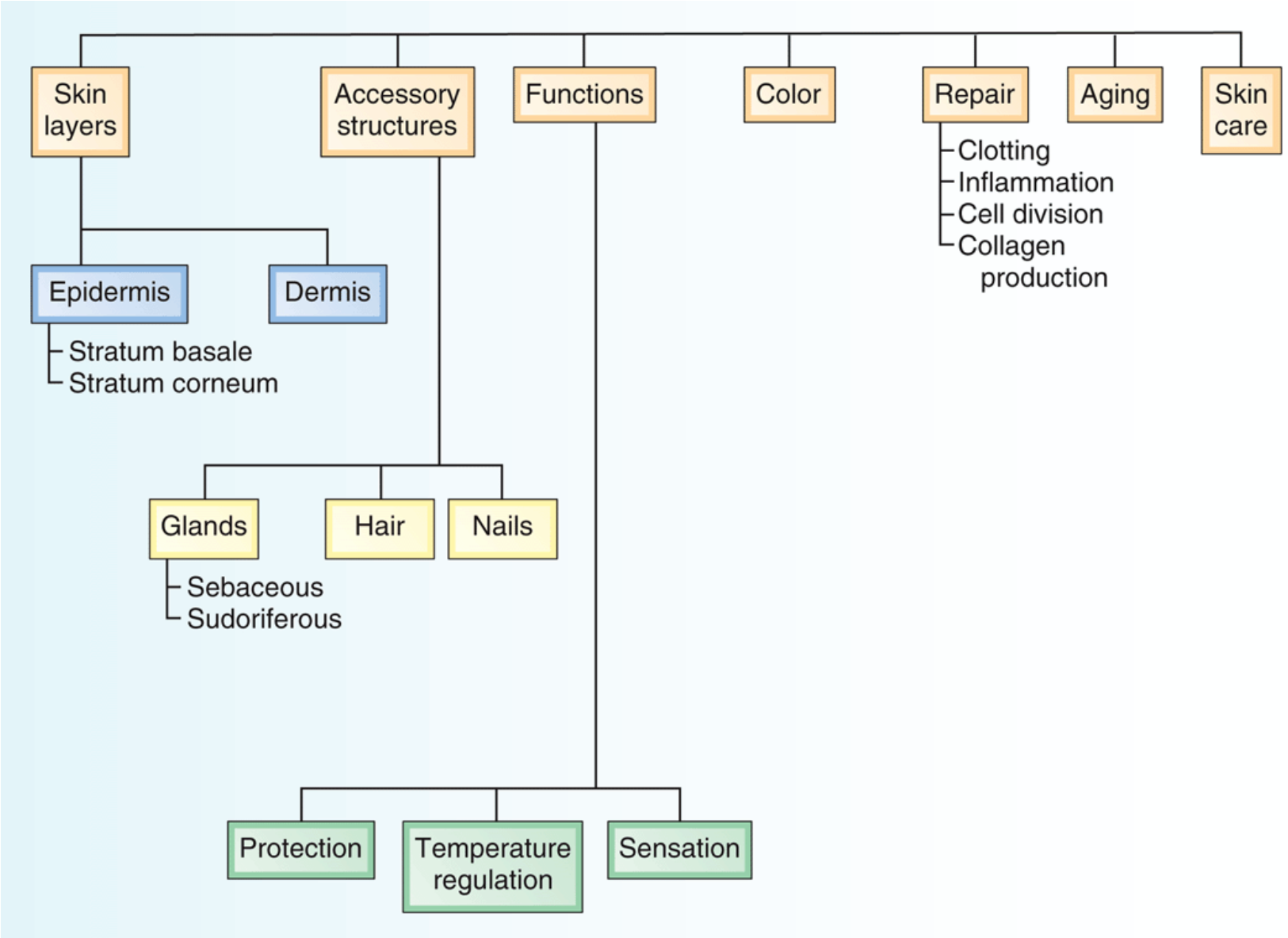
Overview



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Additional lecture notes

- **Epidermis is responsible for protection, it is normally made up of 4-5 layers depending on the site. All over the body the epidermis is made up of 4 layers, but on the soles of feet and palm it's made up of 5 layers for protection and elasticity.**
- **Epidermis is made up of:**
  - **Stratum corneum—is made up of dead non-nucleated keratinocytes.**
  - **Stratum granulosum**
  - **Stratum spinosum**
  - **Stratum Basale—only layer that undergoes division and pushes cells to the top.**
    - **Collectively these layers are called keratinocytes because they produce keratin.**

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Additional lecture notes

- **In the epidermis we not only find keratinocytes, but melanocytes (produce melanin and protect skin from sun) and Langerhans (acts as an immune cell with originates from the blood). Meckel cells are responsible for sensation (sensory touch receptors).**
- **Epidermis is avascular supplied by diffusion like epithelium and cartilage.**
- **Epidermis is keratinized stratified squamous epithelium.**

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Additional Lecture notes

- **Dermis is made up of dense C.T. which is composed of fibers, cells, B.V. nerves, glands and hair follicles .**
- **Shedding—basal layer divides pushing older cells upwards to corneum. Sheds/scales.**
- **It takes 28-30 days for cells to be pushed from basal to corneum and another 28-30 days to shed.**
- **So in total takes 56-60 days.**
- **This is important because there are some disease where the shedding is really slow—this is called delayed shedding. So their skin will be thick called Ichthyosis (corneum layer thick with collections of dead cells). In other diseases shedding will be rapid within 2-3 days, like psoriasis.**

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Structure of the Skin

Learning Outcomes

1. Name and describe the layers of the skin.
2. Describe the subcutaneous layer.
3. Functions of skin.
4. Primary and secondary skin lesions.

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The Integumentary System

- Composed of two parts
  - Skin
  - Associated structures

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Structure of the Skin

- The skin consists of two layers
  - Epidermis
  - Dermis
- Underneath and supporting the dermis is the subcutaneous layer.

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Structure of the Skin

Epidermis

Location	Description	Function
Outermost portion of skin	- Composed mostly of stratified squamous epithelium - **Avascular** - Composed of several layers • **Stratum corneum** - Most superficial - Highly keratinized - Constantly shed • **Stratum basale** - Deepest - Produces new epithelial cells • **Stratum granulosum** • **Stratum spinosum**	- Protection from wear and tear, injury, and harmful substances - Melanin protects from UV radiation

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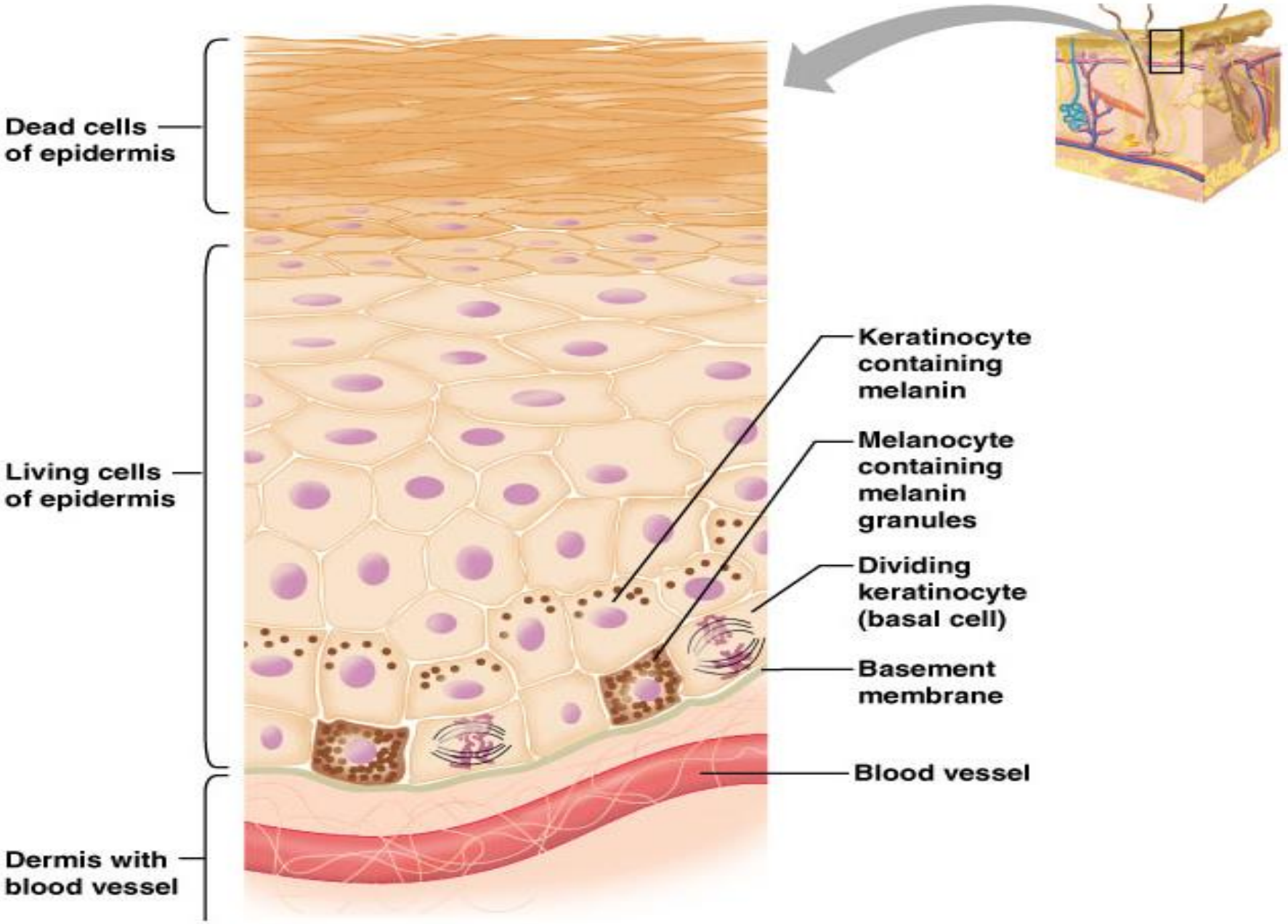

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Structure of the Skin

Dermis

Location	Description	Function
Beneath epidermis	- Composed of connective tissue - Vascular - Contains accessory structures • Hair follicles • Sebaceous glands • Sudoriferous glands **(sweat glands)** • Sensory receptors • **Blood v**essels	- Protection - Nourishment of epidermis - Skin elasticity - Sensory perception

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Structure of the Skin

Subcutaneous Layer

Location	Description	Function
Beneath dermis	- Composed of loose connective tissue with large amounts of adipose tissue - Has blood vessels and nerve endings	- Connects skin to underlying muscle - Insulation - Temperature regulation - Sensory perception - **Shock absorber**

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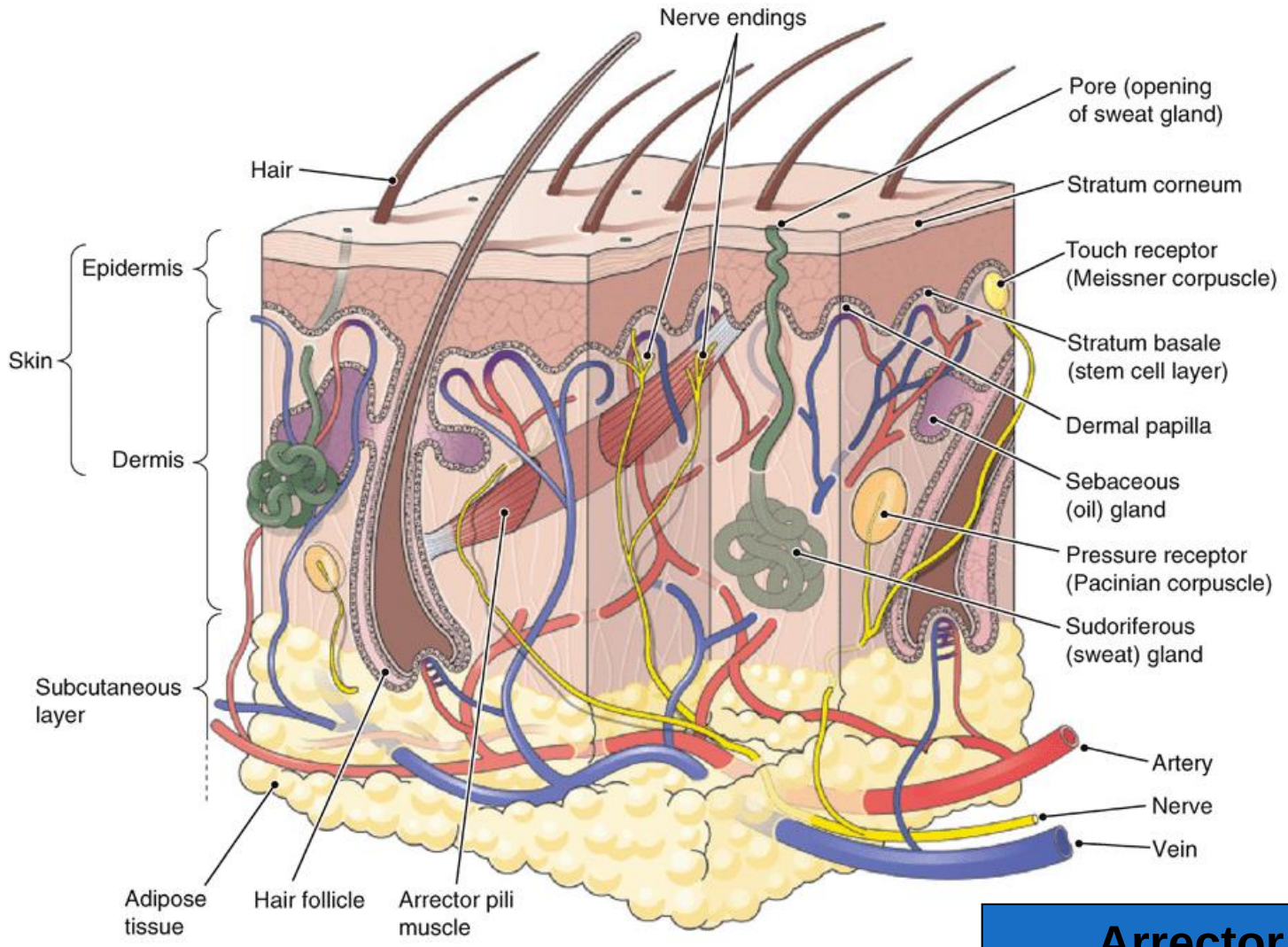
Figure 5-1 Cross-section of the skin.



How is the epidermis supplied with oxygen and nutrients?
What tissue is located beneath the skin?

Arrector pili muscle is responsible for hair erection

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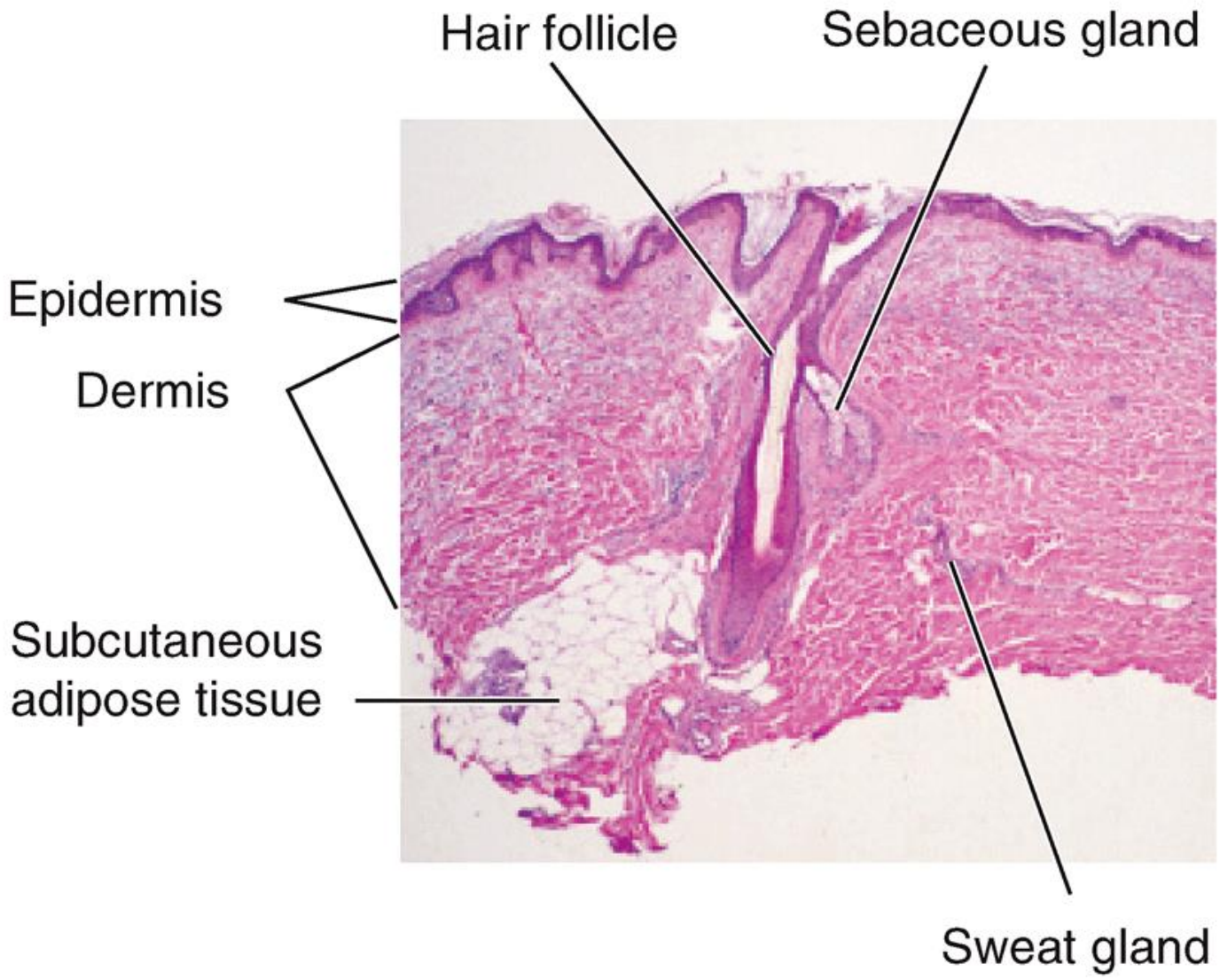
Figure 5-2 Microscopic view of thin skin.



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EPIDERMIS

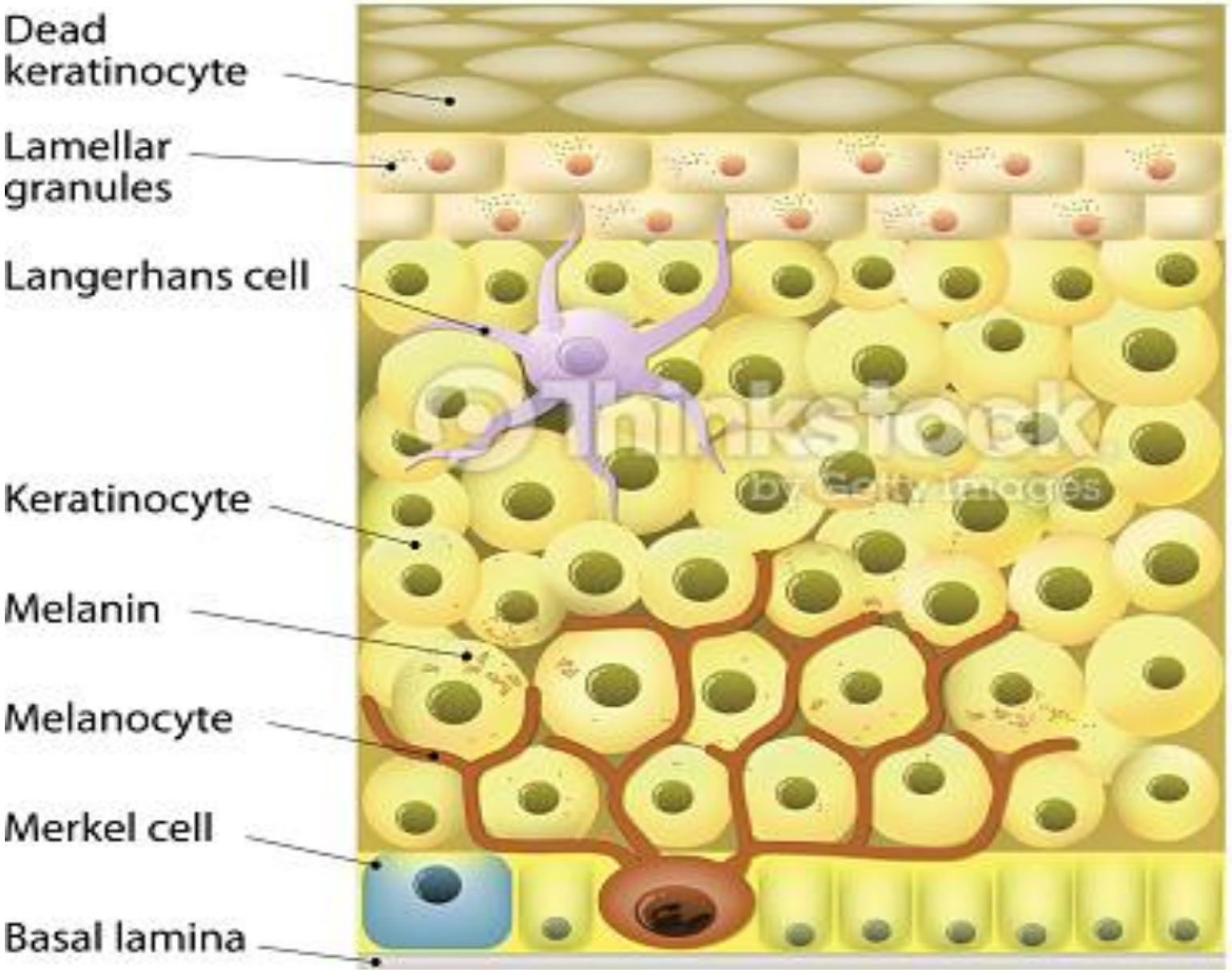

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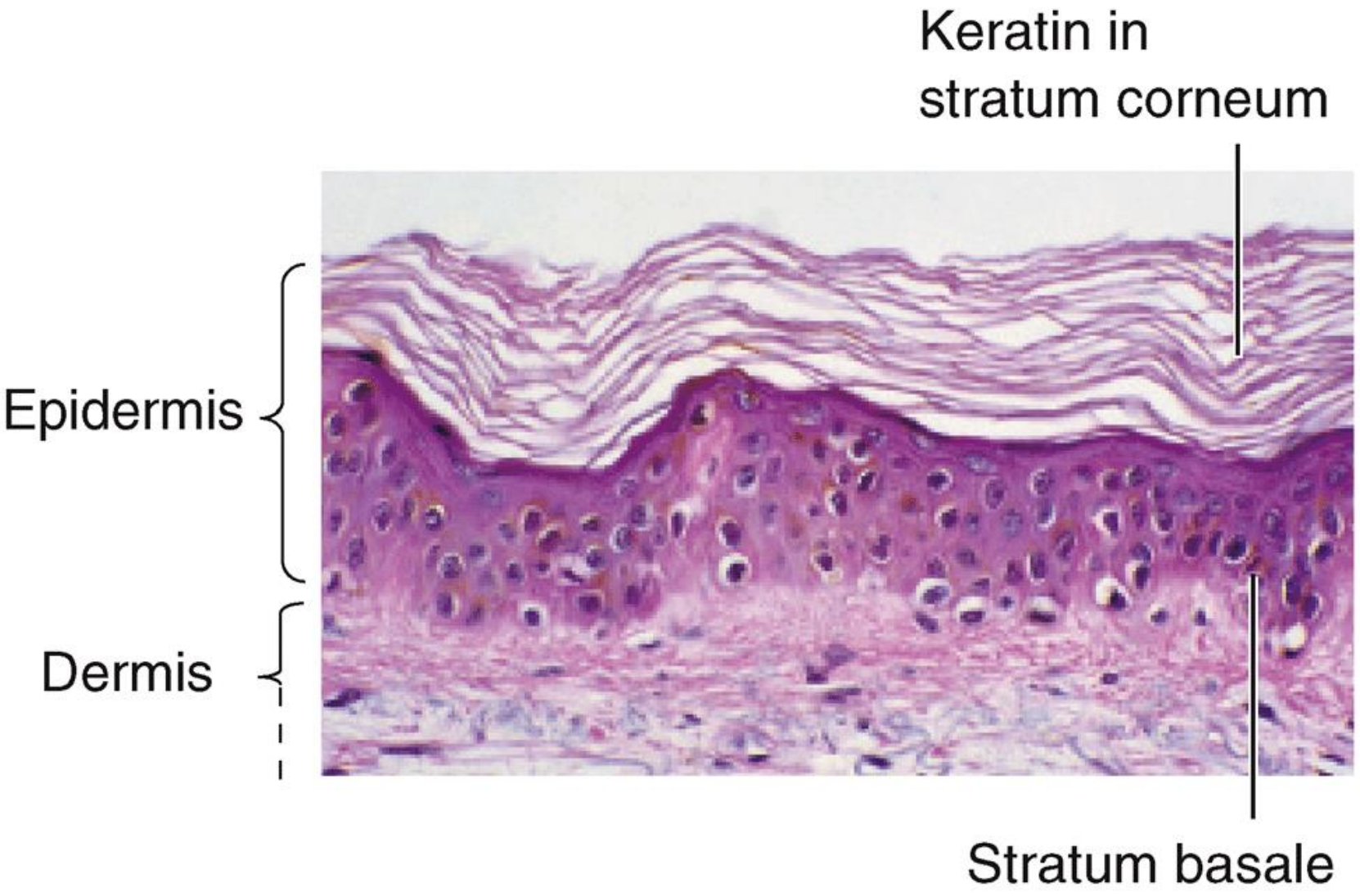
Figure 5-3 Upper portion of the skin.



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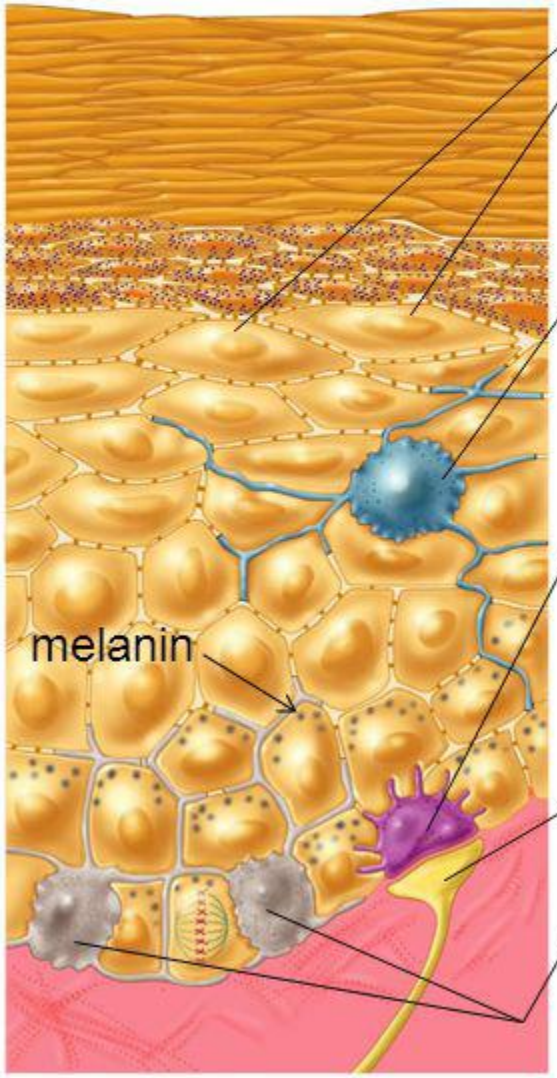
4 Epidermal Cell Types



Keratinocytes – make keratin fibrous protein

Langerhans' Cells – star shaped, epidermal dendritic phagocytic cells

Merkel Cells – half-sun touch receptors

- associated w/ **sensory nerve endings**

Melanocytes – makes brown pigment **melanin**

- shields keratinocyte DNA from UV damage

Three skin pigments

- Melanin
- Carotene: from carrots and yellow vegies
- Hemoglobin: the pink of light skin

◉ **Melanin** in granules passes from one melanocytes (same number in all races) to 36 keratinocytes via **melanosome.**

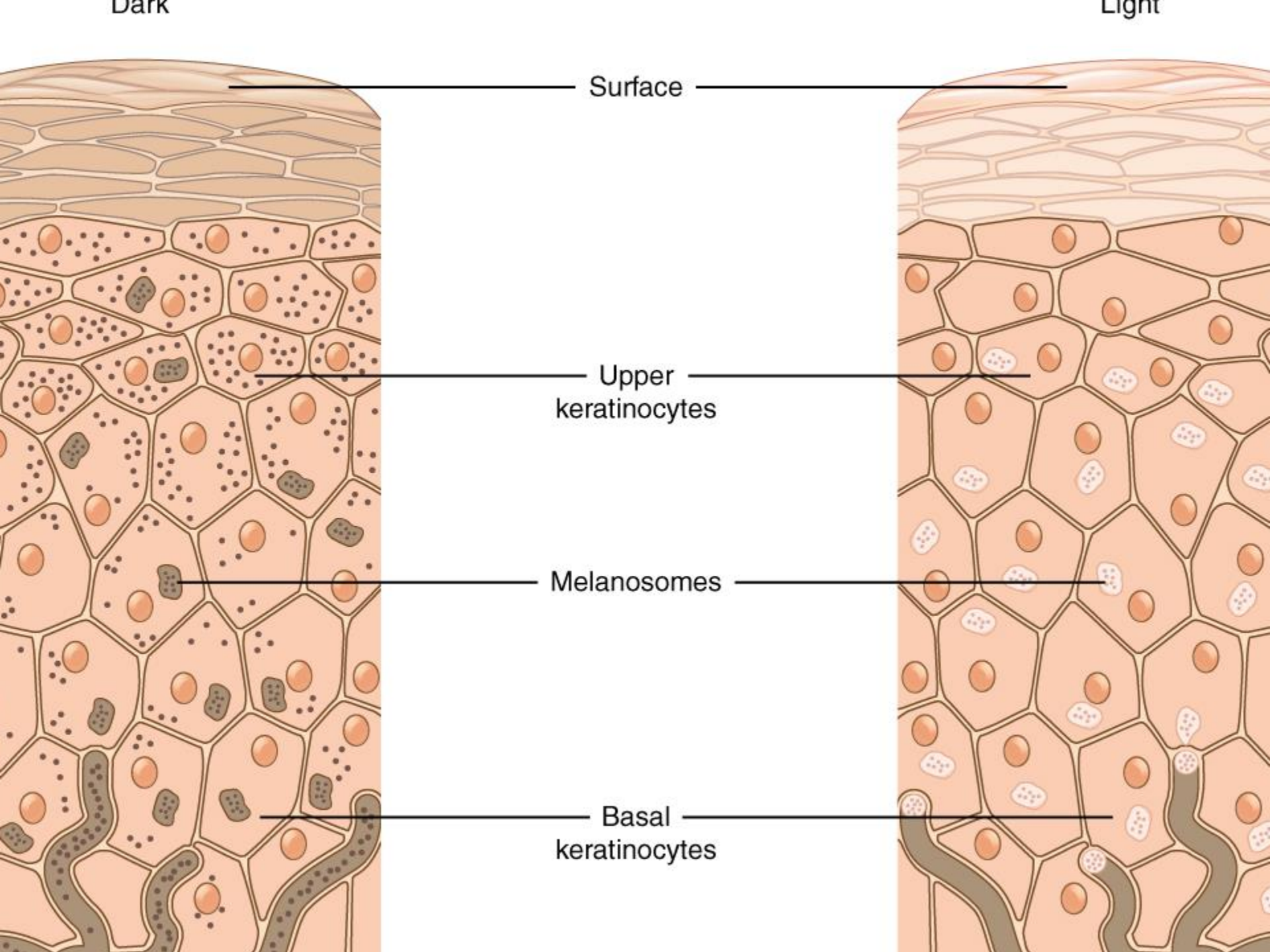
- Digested by lysosomes,
- Variations in color,
- Protection from UV light.

Note: People's skin tone/color is determined by these 3 pigments.

Is the number of melanocytes different in a white person than a dark skinned one?

No the number of melanocytes doesn't change, what matters is their activity.

Some are highly active therefore they'll have dark skin, where as when the activity is low will be light skinned.


Dark
Light
Surface
Upper keratinocytes
Melanosomes
Basal keratinocytes

Structure of the Skin

Checkpoints

5-1 What is the name of the system that comprises the skin and all its associated structures?

5-2 Moving from the superficial to the deeper layer, what are the names of the two layers of the skin?

5-3 What is the composition of the subcutaneous layer?

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Structure of the Skin

Pop Quiz

Where do new epidermal cells come from?

A) Subcutaneous layer

B) Stratum basale

C) Stratum corneum

D) Dermis

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Structure of the Skin

Pop Quiz Answer

Where do new epidermal cells come from?

A) Subcutaneous layer

B) Stratum basale

C) Stratum corneum

D) Dermis

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Accessory Structures of the Skin

Learning Outcome

3. Give the location and function of the accessory structures of the integumentary system.

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Accessory Structures of the Skin

- Help protect the skin and give it more functions
- Include:
  - Sebaceous oil glands
  - Sweet glands
  - Hair
  - Nails

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Accessory Structures of the Skin

Glands

Structure	Description	Function
Sebaceous (oil) glands	- Saclike glands associated with hair follicles	- Secrete sebum, an oily substance that lubricates and water proofs the skin
Sudoriferous (sweat) glands	- Coiled glands that vent directly to the skin surface or through hair follicles	- Release perspiration to cool body by evaporation - Eliminate some soluble wastes

Note: Sebaceous glands open into hair follicle. Histologically it appears white because it's made up of oily substance so when stained the fat melts and it looks white.
Sebum has immunological substances which protects against infections. Problem in sebaceous system is acne.
Sweat glands has 2 types:
One opens to skin—called eccrine found all over the body.
The other one opens to hair—called Apocrine found in axilla and genitalia—the apocrine gland secrets viscous secretions and causes the bad smell.

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Accessory Structures of the Skin

Hair and Nails

Structure	Description	Function
Hair	- Composed of keratin - Develops in a follicle - Grows from base of follicle - Structure • Follicle • Shaft • Root • Arrector pili muscle	- Conserve heat when raised by arrector pili muscles - Stimulates secretion of sebum
Nails	- Cover distal end of fingers and toes - Composed of keratin - Grow from proximal end - Structure • Root • Plate • Lunula	- Protection - Help in grasping objects

Note: hairs and nails are made up of keratin which is a protein produced from keratinocytes responsible for protection. Hair follicle acts as a passage way for glands. Erection of the hair follicle also helps to prevent hypothermia, blood is pulled from superficial areas to deep tissue.

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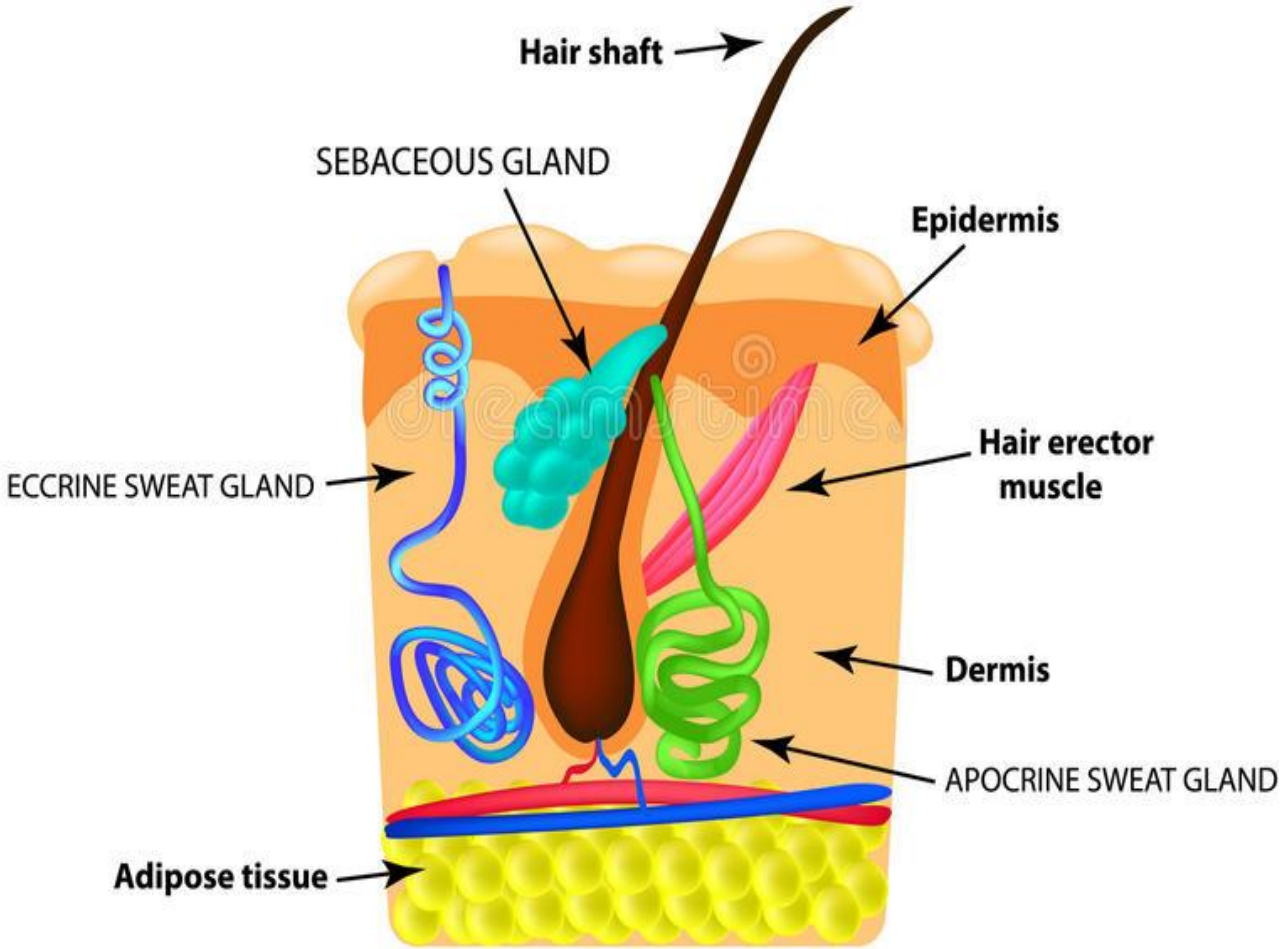
GLANDS OF THE SKIN



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- The sebaceous glands secrete an oily substance that
- protects the skin and prevent excess water loss.
- ◉ Meibomian glands **(eyelids)**
- ◉ Fordyce spots **(lips, gums and innercheeks,**
- **and genitals)**
- ◉ Areolar glands **(female nipples)**
- ◉ Several related medical conditions involve sebum
- —including
- ◉ acne, sebaceous cysts,
- ◉ hyperplasia, and sebaceous adenoma

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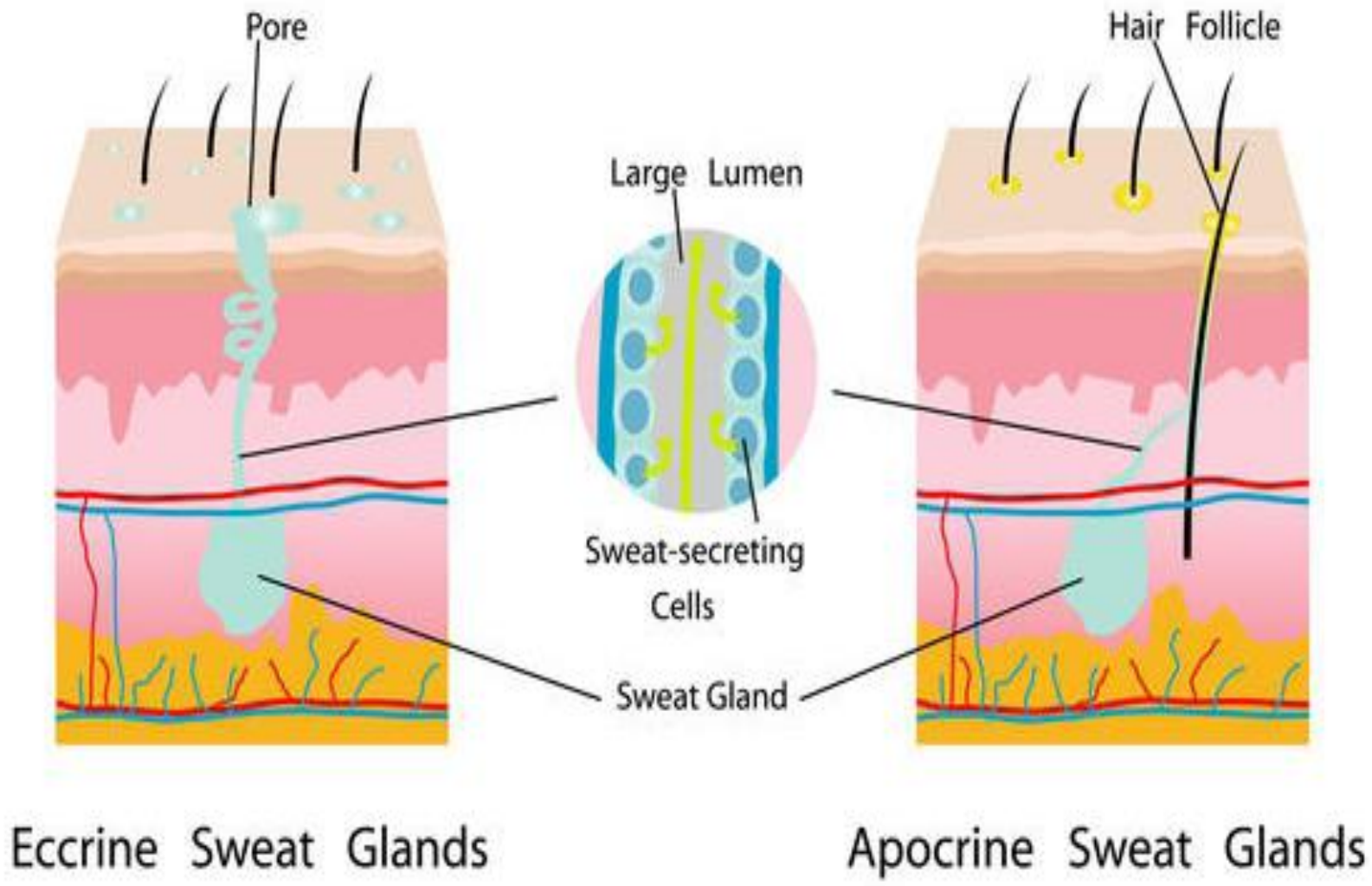

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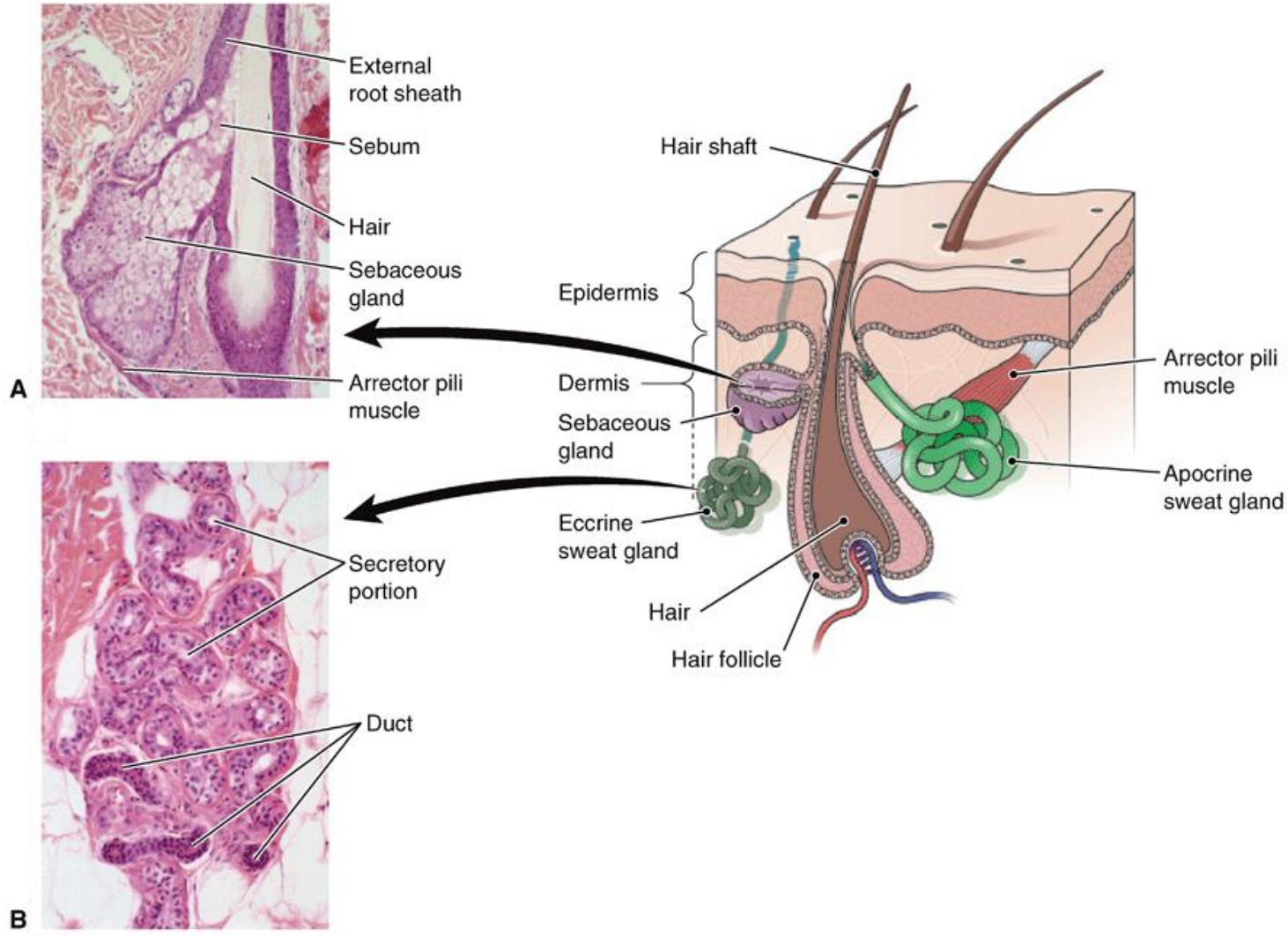
Figure 5-4 Portion of skin showing associated glands and hair.



How do the sebaceous glands and apocrine sweat glands secrete to the outside?
What kind of epithelium makes up the sweat glands?

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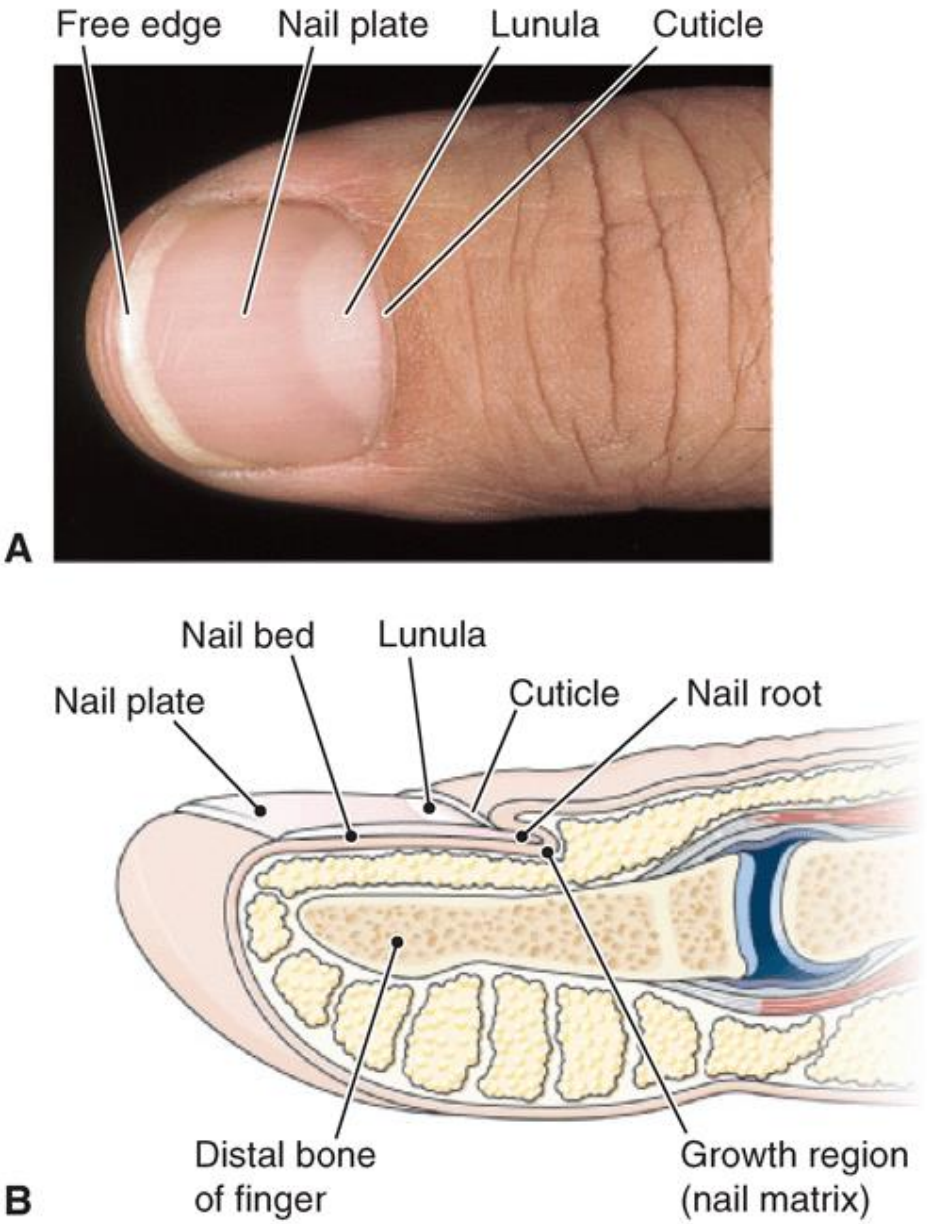
Figure 5-5 Nail structure.

Note: Lunula is not always present. Under the nail is called nail bed.

Note: If trauma occurred on proximal end of nail—the nail will grow with deformities. If it occur on distal part it will continue to grow normally.



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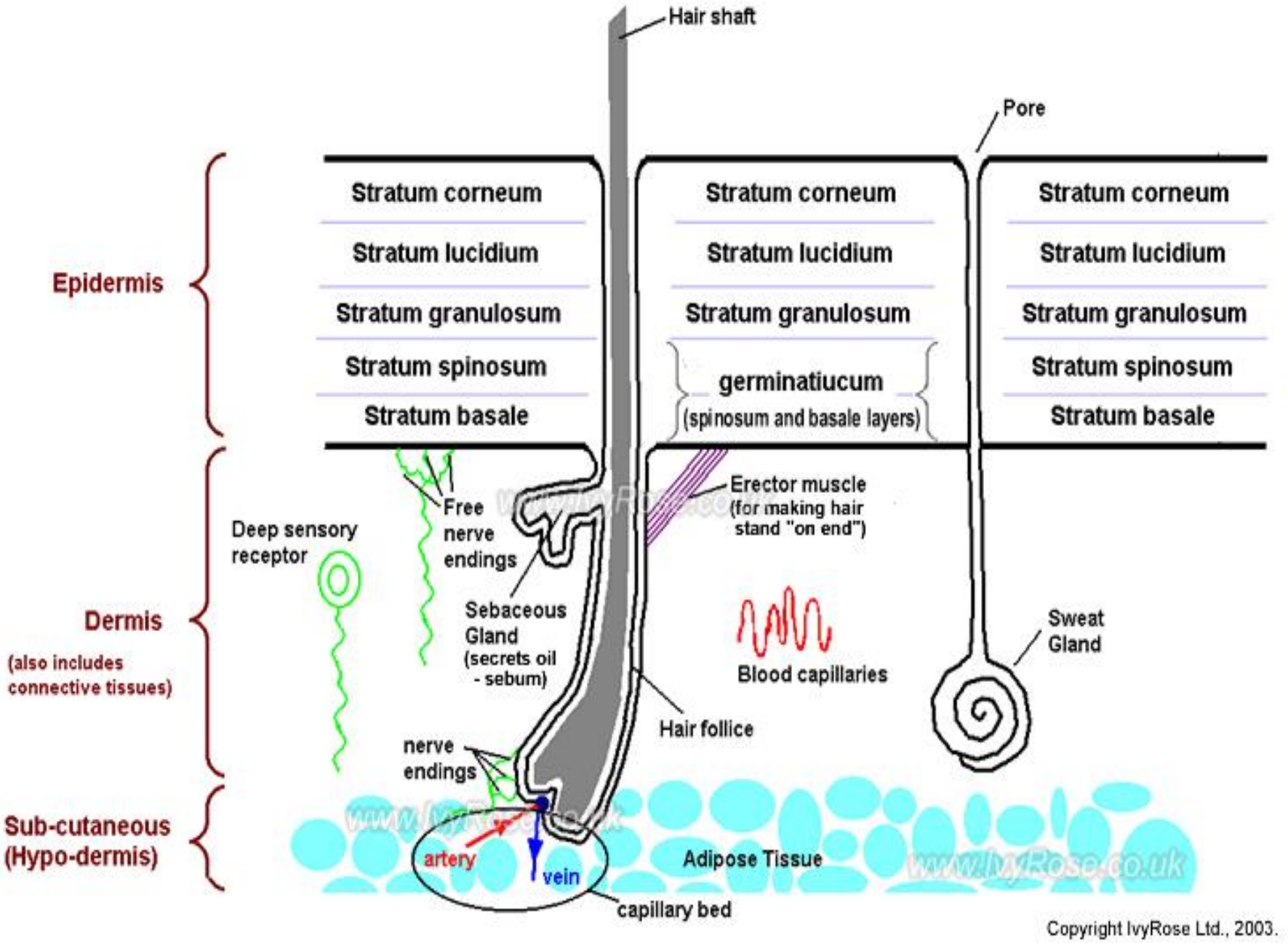

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Accessory Structures of the Skin

Checkpoints

5-4 What is the name of the skin glands that produce an oily secretion?

5-5 What is the scientific name for the sweat glands?

5-6 What is the name of the sheath in which a hair develops?

5-7 Where are the active cells that produce a nail located?

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Accessory Structures of the Skin

Pop Quiz

The maintenance of constant body temperature would be difficult without the actions of the

A) Apocrine glands

B) Meibomian glands

C) Sebaceous glands

D) Eccrine glands

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Accessory Structures of the Skin

Pop Quiz Answer

The maintenance of constant body temperature would be difficult without the actions of the

A) Apocrine glands

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C) Sebaceous glands

D) Eccrine glasses

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Functions of the Integumentary System

Learning Outcome

4. List the main functions of the integumentary system.

Note:

- Thermoregulation
- Protection from physical substances, chemicals and infections.
- Excretion and absorption
- Sensation
- Vit. D. synthesis, which begins in skin as 7-dehydrocholesterol—then it goes to the liver and then the kidney.

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Functions of the Integumentary System

- Four major functions:
  1. Protection against infection
  2. Protection against dehydration (drying)
  3. Regulation of body temperature
  4. Collection of sensory information

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Functions of the Integumentary System

Protection Against Infection

- Intact skin forms a primary barrier against invasion.
- Interlocking pattern resists penetration.
- Shedding removes pathogens.
- Protects against bacterial toxins
- Protects against some harmful environmental chemicals

By the skin's antibodies.

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Functions of the Integumentary System

Protection Against Dehydration

- Skin prevents water loss by evaporation.
  - Keratin in the epidermis
  - Sebum release from the sebaceous glands

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Functions of the Integumentary System

Regulation of Body Temperature

- Loss of excess heat and protection from cold are important functions of the skin.
  - Constriction of blood vessels
  - Dilation of blood vessels
  - Evaporation of perspiration

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Functions of the Integumentary System

Collection of Sensory Information

- Skin has many nerve endings and other special receptors.
  - Free nerve endings
  - Touch receptors (Meissner corpuscle)
  - Deep pressure receptors (Pacinian corpuscle)

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Functions of the Integumentary System

Other Activities of the Skin

- Absorption of substances such as medications
- Excretion
  - Water
  - Electrolytes
  - Wastes
- Manufacture of vitamin D

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Functions of the Integumentary System

Checkpoints

5-8 What two substances produced in the skin help to prevent dehydration? Keratin and sebum

5-9 What two mechanisms involving the skin are used to regulate temperature?

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Functions of the Integumentary System

Pop Quiz

Which of the following is NOT a function of skin?

A) Respiration

B) Excretion

C) Sensation

D) Thermoregulation

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Functions of the Integumentary System

Pop Quiz Answer

Which of the following is NOT a function of skin?

A) Respiration

B) Excretion

C) Sensation

D) Thermoregulation

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Color of the Skin

Learning Outcome

5. Discuss the factors that contribute to skin color.

Note:

Melanin, carotene, and Hemoglobin.

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Color of the Skin

- Factors that influence skin color include:
  - Melanin
  - Hemoglobin
  - Carotene
  - Bile pigments

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Color of the Skin

Checkpoints

5-10 What are some pigments that impart color to the skin?

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Color of the Skin

Pop Quiz

Which pigment is responsible for a tan's brown color?

A) Melanin

B) Carotene

C) Hemoglobin

D) Bile

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Color of the Skin

Pop Quiz Answer

Which pigment is responsible for a tan's brown color?

A) Melanin

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Repair of the Integument

Wound Healing

- Occurs only in areas with actively dividing cells
  - Epithelial tissues
  - Connective tissues
  - Minimally in muscle and nervous tissue

Factors That Affect Healing

- Nutrition
- Blood supply
- Infection
- Age

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Repair of the Integument

Checkpoint

5-11 What two categories of tissues repair themselves most easily?

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Word Anatomy

Word Part	Meaning	Example
derm/o	skin	The *epidermis* is the outermost layer of skin.
corne/o	cornified, keratinized	The *stratum corneum* is the outermost thickened, keratinized layer of the skin.
melan/o	dark, black	A *melanocyte* is a cell that produces the dark pigment melanin.
sub-	under, below	The *subcutaneous* layer is under the skin.
ap/o-	separation from, derivation from	The *apocrine* sweat glands release some cellular material in their secretions
pil/o	hair	The *arrector pili* muscle raises the hair to produce goose bumps.

Spongiosis—intracellular edema.
Hyperkeratosis—increase keratinocytes= increase in keratin
Acanthosis may be normal, paraneoplastic or due to insulin resistance.

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Description of Skin Lesions

Primary and ***secondary*** lesions (***eflorescence***)

- ✓ **single** or **multiple**
- ✓ **grouped** (multiple lesions grouped in one area)
- ✓ **disseminated** (exanthema – widespread discrete lesions)
- ✓ **arranged** (in line, in ring, snake-like…)

Note: Identify if the lesion is primary or secondary. Then see if it's a single lesion or multiple. Secondary lesions are derived from primary lesions or a person's action/reaction such as itching.

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Additional Lecture notes:

- When you see a lesion for the first time, must see if it is: :

Raised	Flat
If it's raised, is it's size less than 1 cm=papule More than 1cm but not More than 2cm=nodule More than 2cm=plaque. These names apply if the content is solid, but if it's elevated with fluid and small called=vesicle (ex. Herpes). If it's elevated with fluid but large called bullae (ex. Burns)	If it's less than 1cm called macule, but if it's more than 1cm called patch. Alteration of color is a flat lesion.
Pustule= papule with pus.	

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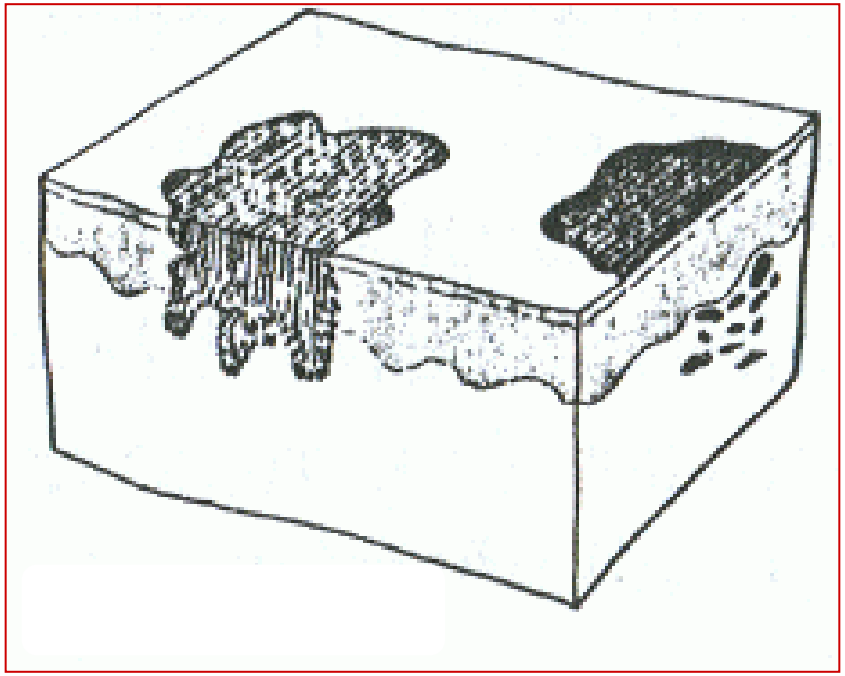
Primary Lesion



MACULE (spot)

any **flat** lesion, circumscribed discoloration, size < 1cm

PATCH = larger macule with some surface changes

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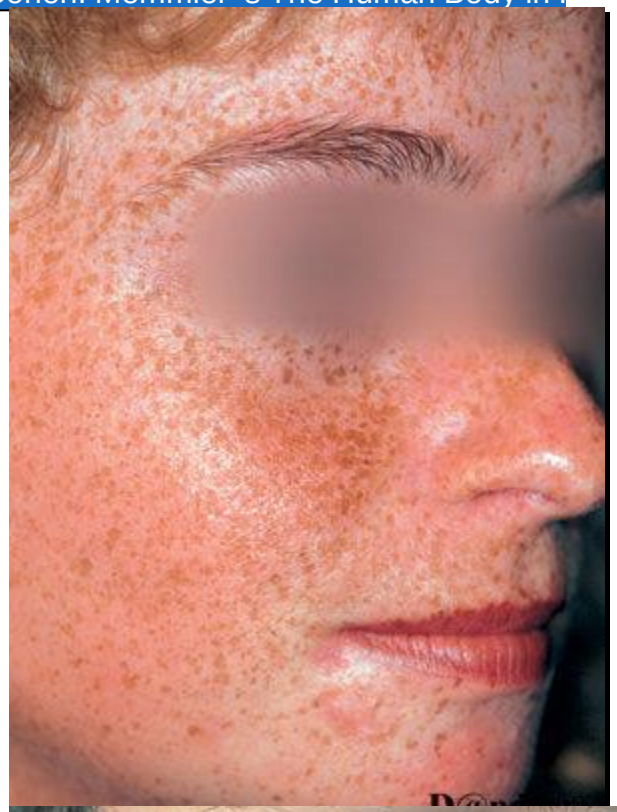
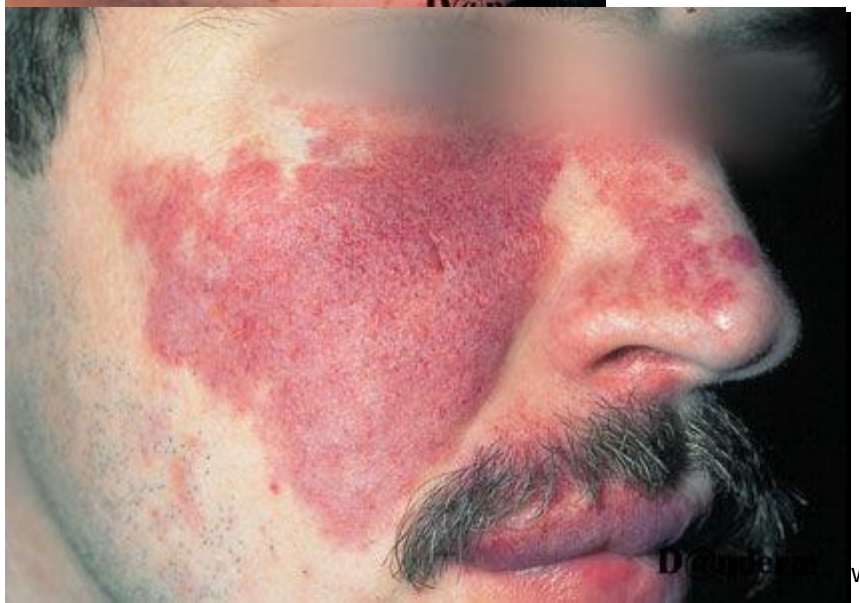
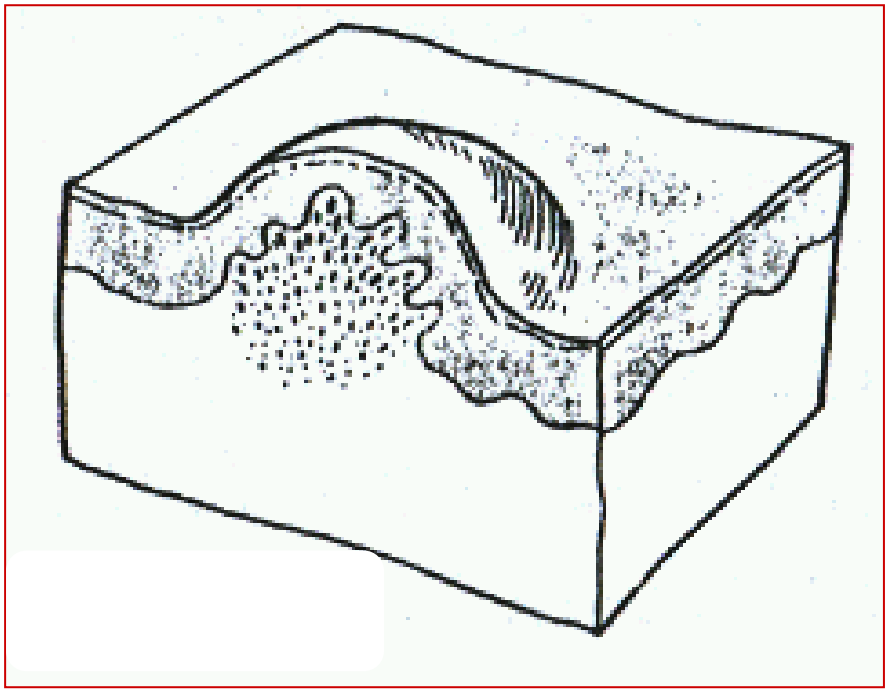
Patch & Macule





Primary Lesion



PAPULE

any **elevated** lesion, size < 1cm, various color, papules may become confluent and form **plaques**

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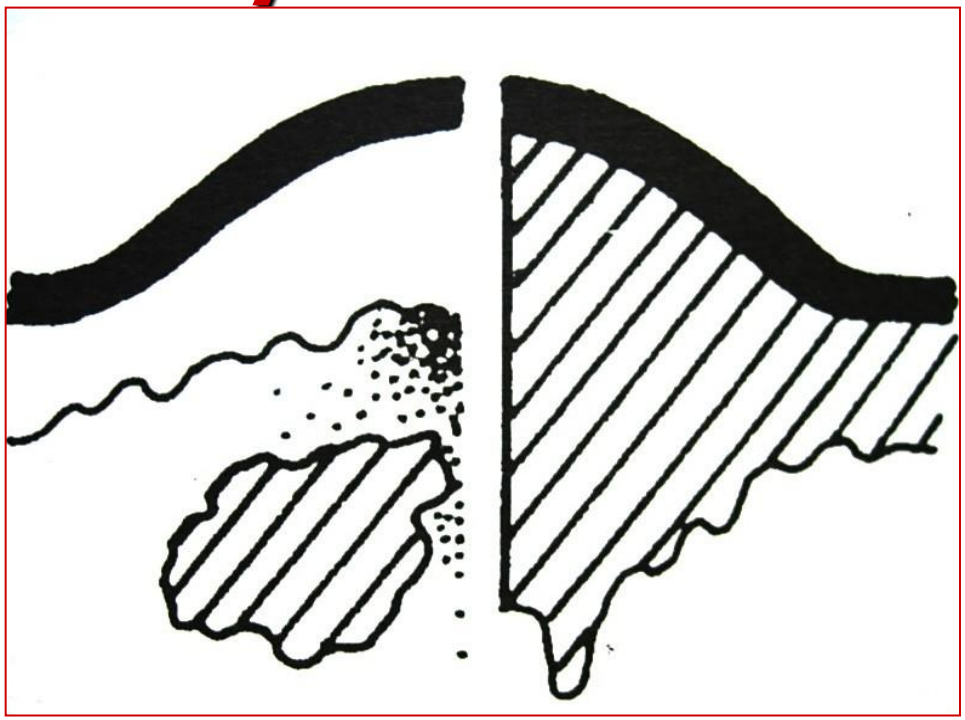
Primary Lesion



NODUL

any **elevated**, circumcribed lesion, **size > 1cm** in both diameter and depth

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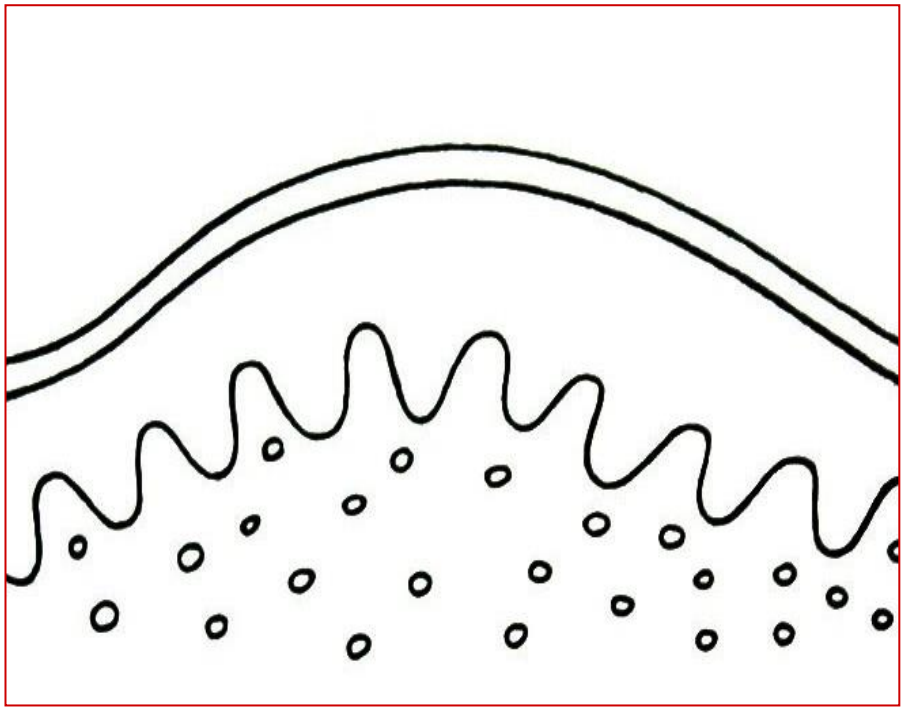
Papule Nodule Plaqu

Primary Lesion

Note: its pathognomonic of disease and migratory Will be round elevated, patch like lesion and shiny



URTICARIA (weal, hives, nettle-rash)

a firm plaque resulting from **dermal oedema**, it is **transient** - may last only **a few** hours

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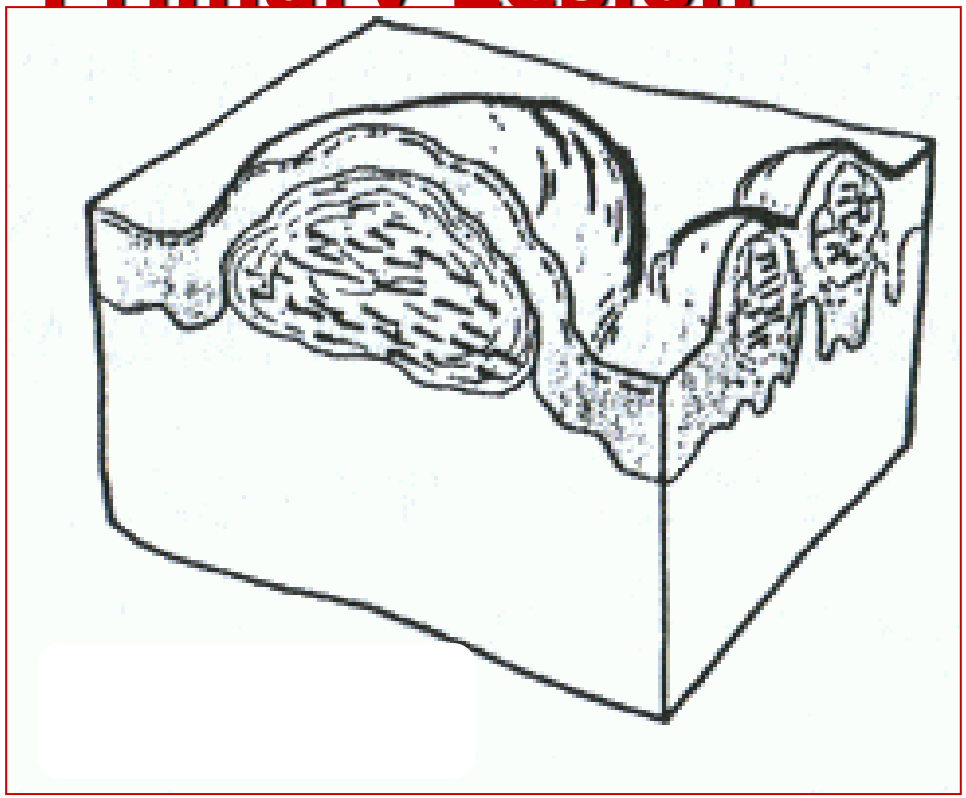
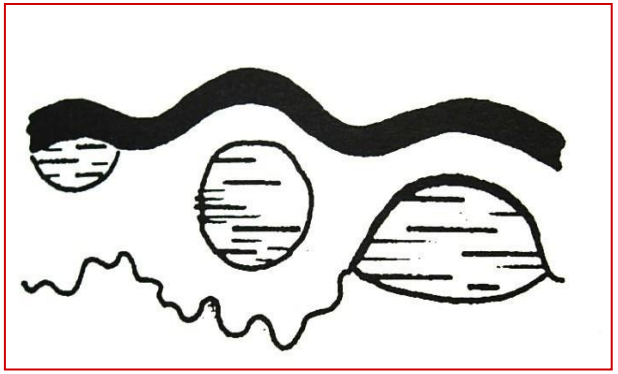
Primary Lesion





VESICLE (blister)

a fluid-filled lesion, size < 1cm,

BULLA - size > 1 cm in diameter

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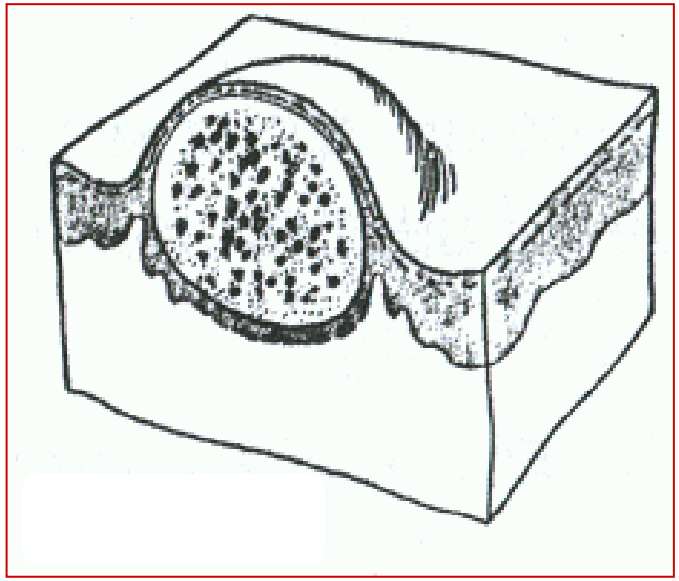
Primary Lesion



PUSTULE

a circumscribed collection of leukocytes and fluid, size < 1cm

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Department of Dermatology
Phone: (+49) 9131- 85 - 2727

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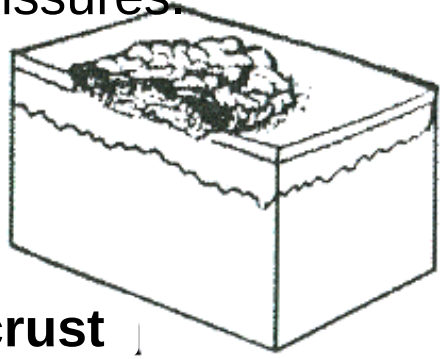
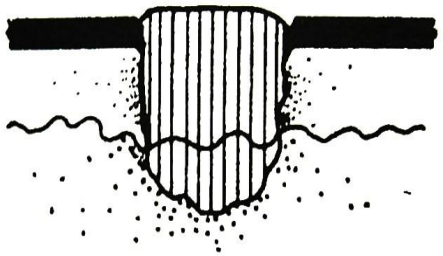
Secondary Lesions

Note: a person with allergies on his skin "chronic" will have thick skin. Someone who keeps scratching/ itching his skin—results in scratch marks= secondary lesion. Kids who walk barefoot for a long time it results in fissures.

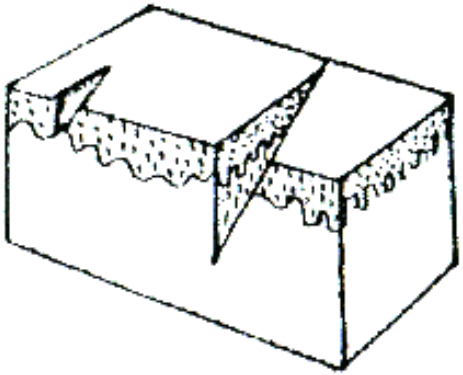


crust

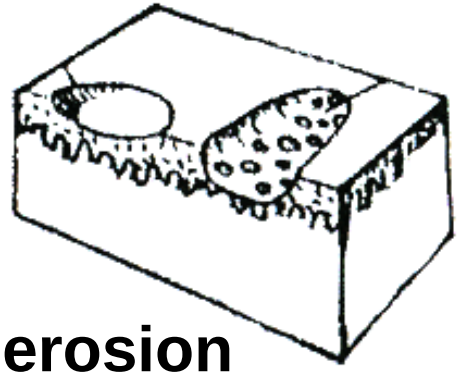


eschar (necrosis)

scale

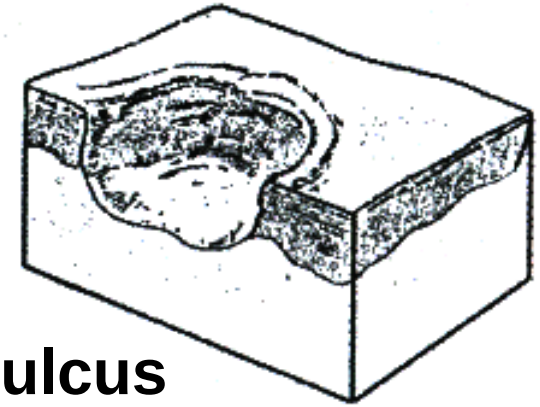


fissure



erosion

excoriation



ulcus

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Additional lecture notes:

- If someone has a papule, and it opens resulting in erosion or ulcer—both of which are secondary lesions.
- Elevated patch= plaque
- Macule ex. Freckles
- Circumscribed= circular
- Annular—ring like, lesion on the edges, the middle is clear.
- Coin shaped
- The lesion description is important in the clinical skills. For example if we see a melasma—will be described as a patch like lesion, covers multiple areas and brown in color, for differential diagnosis.
- Nodule—elevated lesion that is usually circumscribed.
- Pustule is usually very light almost white.
- Vesicle when it appears it looks grayish.
- When vesicle opens it shows eroded area/skin
- Pustule when it opens up it leaves behind a papule.
- Erosion of epidermis= normal healing.
- Ulcer—affects dermis= leads to scar formation.

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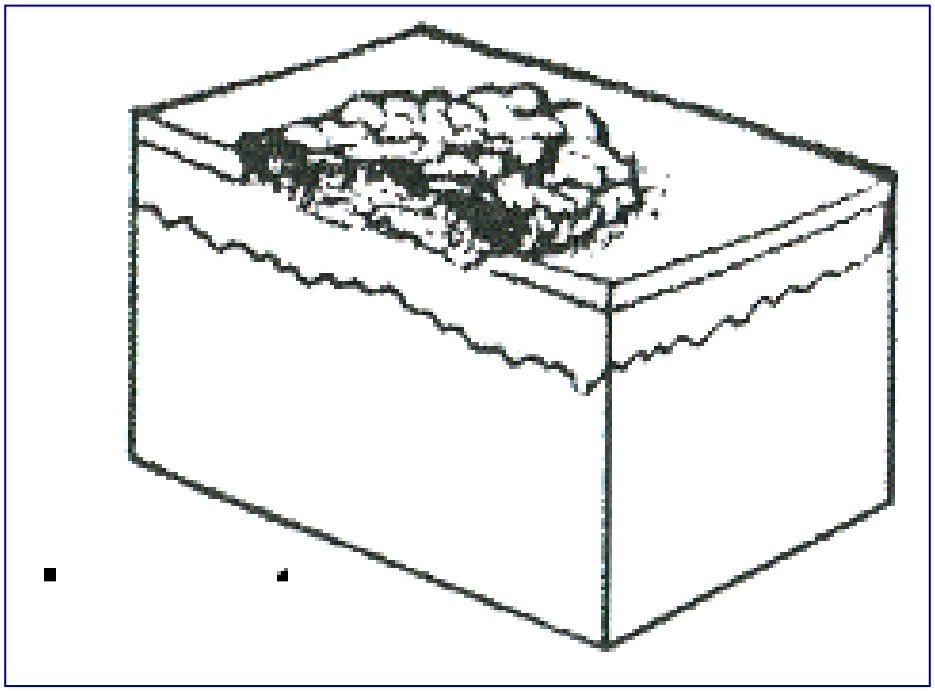
Secondary Lesion

Note: 3rd phase of leishmania. Leishmania begins as papule, then nodule and then it forms a crust.



CRUST

a collection of **dried** serum, blood or pus, and cellular debris

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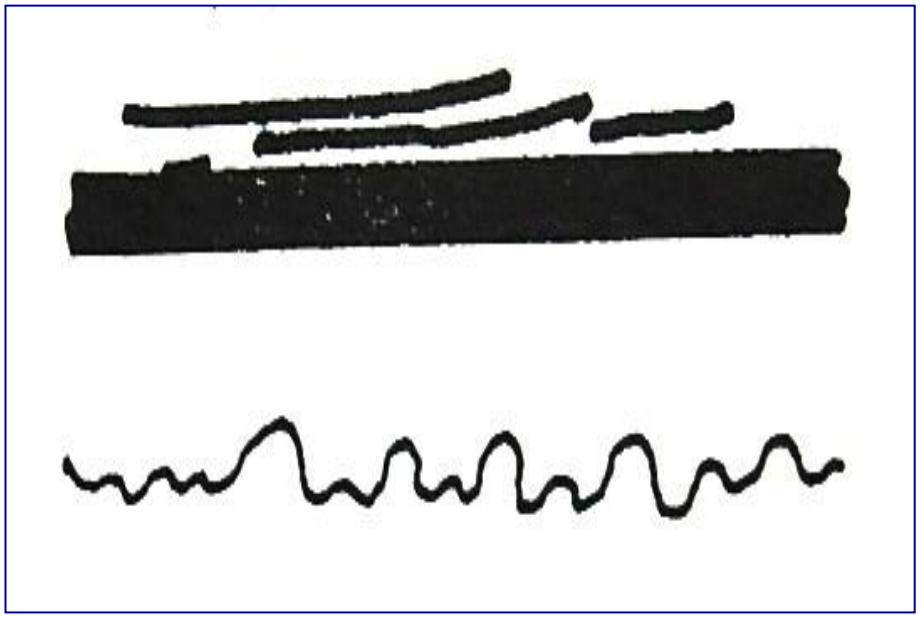
Secondary Lesion

Note: People who don't use lotion and have very dry skin, the white small pieces that fall off skin are scales.



SCALE (squama)

an excess **dead keratinocytes** that are produced by abnormal keratinization and shedding, scale are **dry** and usually whitish or yellowish

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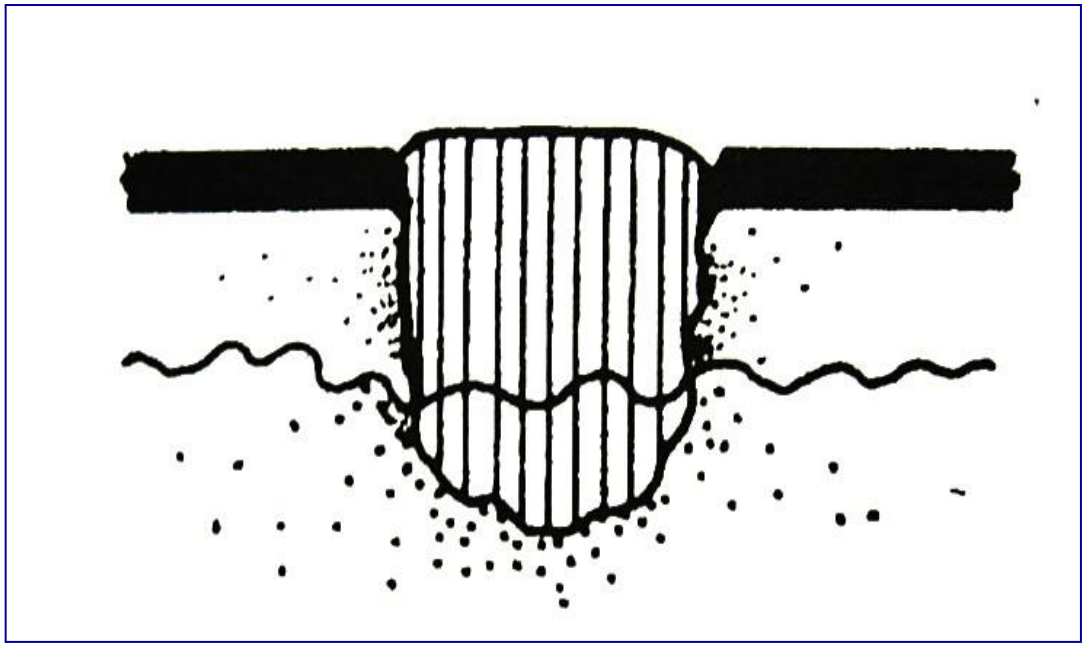
Secondary Lesion



ESCHAR (necrosis)

(e.g. bedsore, burn…)

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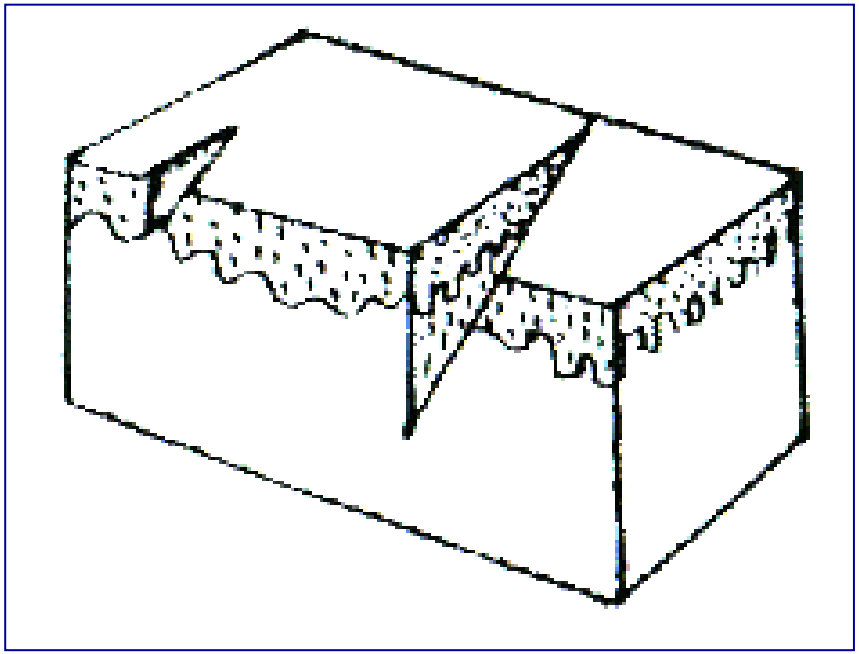
Secondary Lesion



FISSURE

a linear split in epidermis or dermis, with sharply defined **vertical** walls, over a **joint** or along a skin **crease**
(skin isn´t flexible due to mycosis, eczema, psoriasis…)

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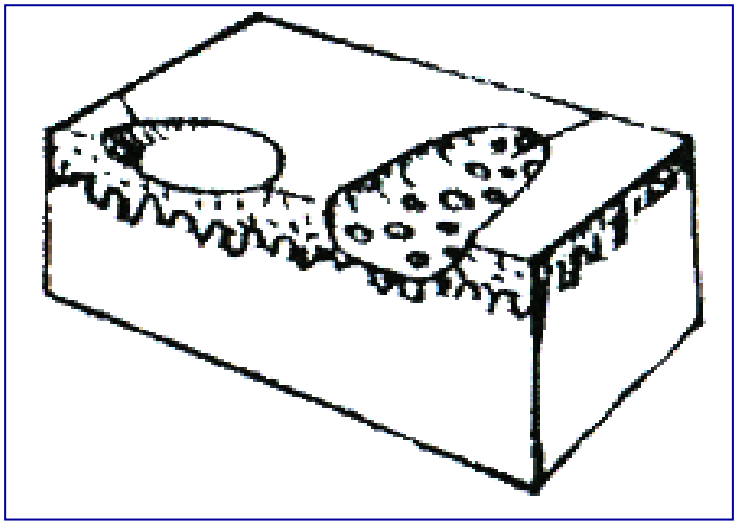
Secondary Lesions



EROSION
a partial loss of **epidermis**, heals without scarring

EXCORIATION
a localized damage to the skin due to **scratching**

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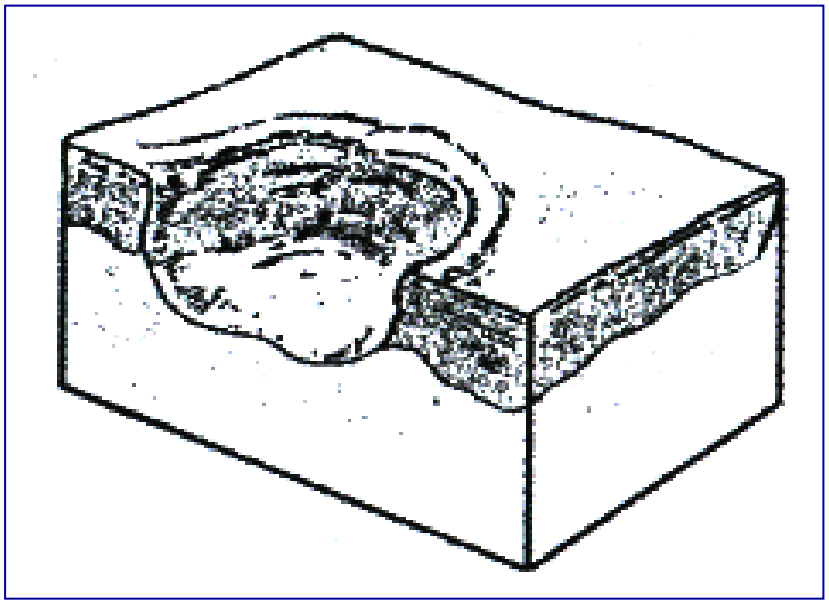
Secondary Lesion



ULCER

a full thickness loss
of **epidermis end dermis**,
which will heal with scarring

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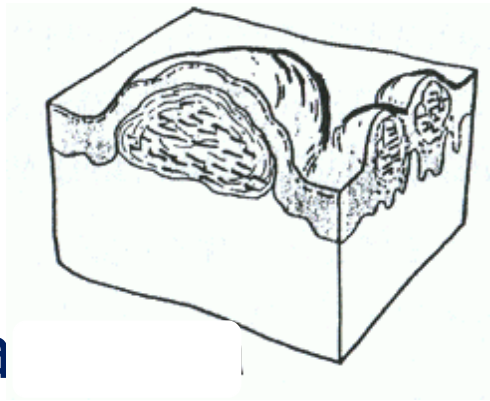
Note: Under the scales there are patches, when scraping off the scale it will be scraped looking like powder.

Keloid-abnormal healing, so closure occurs with hypertrophy considered secondary lesion

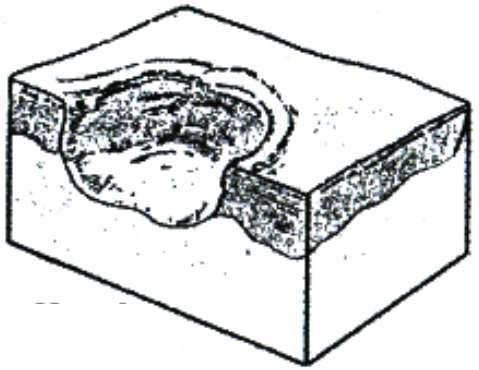
Blisters, pustules:



- **blister roof** – thin, thick, flaccid…
- **content** – clear, turbid, haemorrha

Ulcers:

- **base** – deep x shallow, uneven, clear, coated, with granulation tiss
- **edge** – undermined, collowed, flat adjacent, with epitelization…



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Crust,
erosion and
ulcer

Ulcer
7 8 2005

Lesions can be:

- ✓ **single** or **multiple**
- ✓ **grouped** (multiple lesions grouped in one area… …are confluent in one area)
- ✓ **disseminated** (exanthema = widespread discrete lesions)
- ✓ **arranged** (lesions form some configuration – e.g. in line, in ring, snake-like…)

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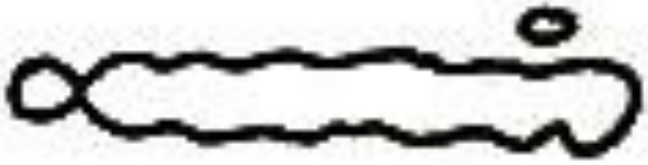
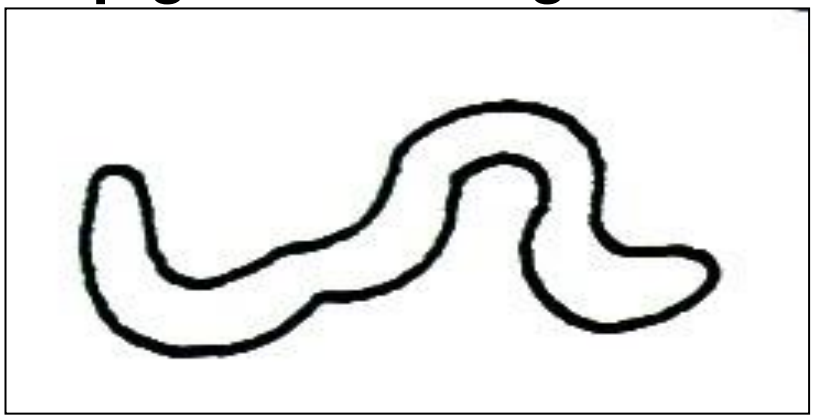
Arrangements of Lesions

linear configuration



moniliform configuration

serpiginous configuration



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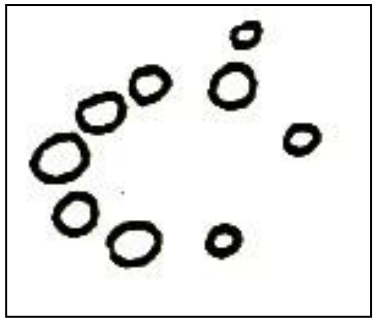
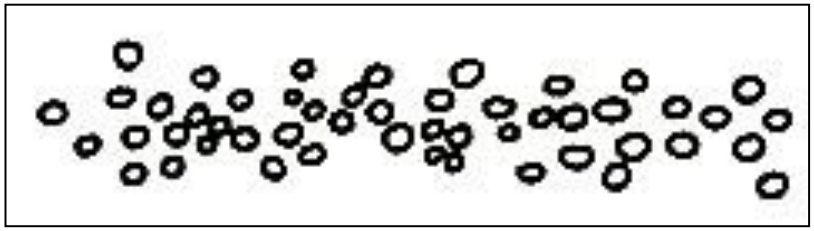
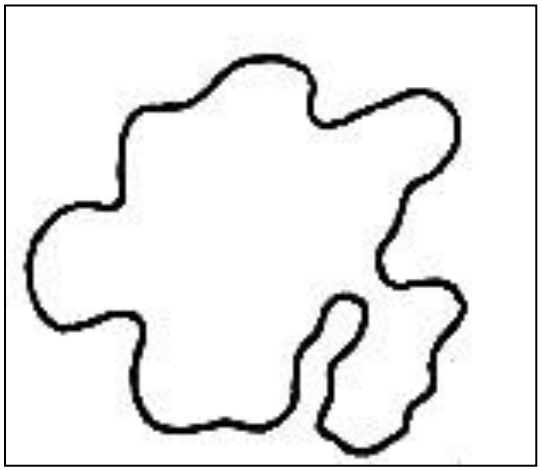
Arrangements of Lesions



herpetiform conf.



zosteriform configuration



geografical configuration

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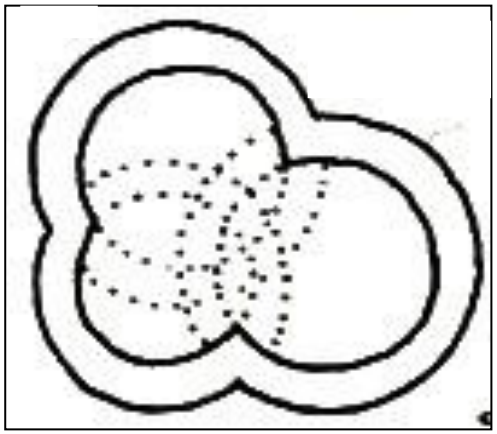
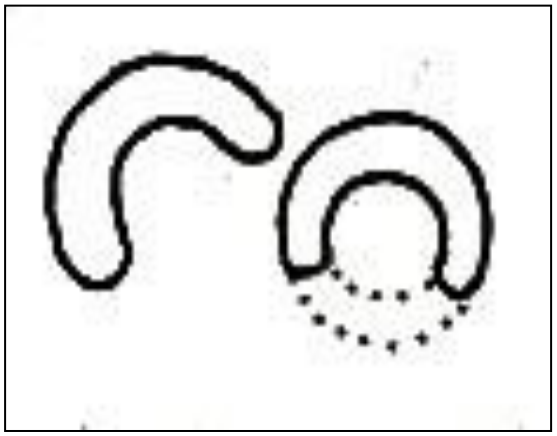
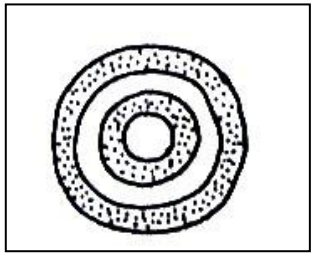
Arrangements of Lesions



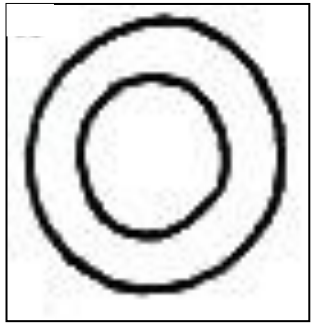


circinate, semicircinate configuration



iris form

(concentric circles)



annular conf.

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Other Changes

…erythroderma, erythema

atrophy, lichenification

papilomatosis, pachydermatosis

hyperpigmentation, depigmentation

scars….

Note: Erythroderma—redness taking more than 80% of the skin.
Atrophy—wasting ex. Wrong I.M injections, or insulin shots. Hypertrophy or atrophy may occur.
Hyperpigmentation is excessive pigment/melanin.
Depigmentation=without pigment.
Hypopigmentation=decreased pigment
Lichenification= is a secondary lesion, where thickening of skin occurs and loss of skin markings. Ex. Chronic eczema.

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Describing of Lesions:

- **sites involved and distribution** (a-symmetrical, predilection sites; arrangement, single or multiple)
- **size** (mm, cm)
- **shape** (round, oval, irregular, pedunculated…)
- **surface features** (smooth, rough, shiny, dull, squamous, uneven…)
- **demarcation - border of lesion** (well defined or circumscribed, poorly defined…)
- **color** (pink, red, purple, white, brown, yellowish…)
- **consistency** (soft, firm, normal, hard, elastic…)
- **surroundings** (with inflammation, normal…)

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Figure 1-6 Vesicle. Confluent vesiculation from patch testing (ACD—nickel).

Figure 1-7 Bulla. Three linear bullae from poison ivy.

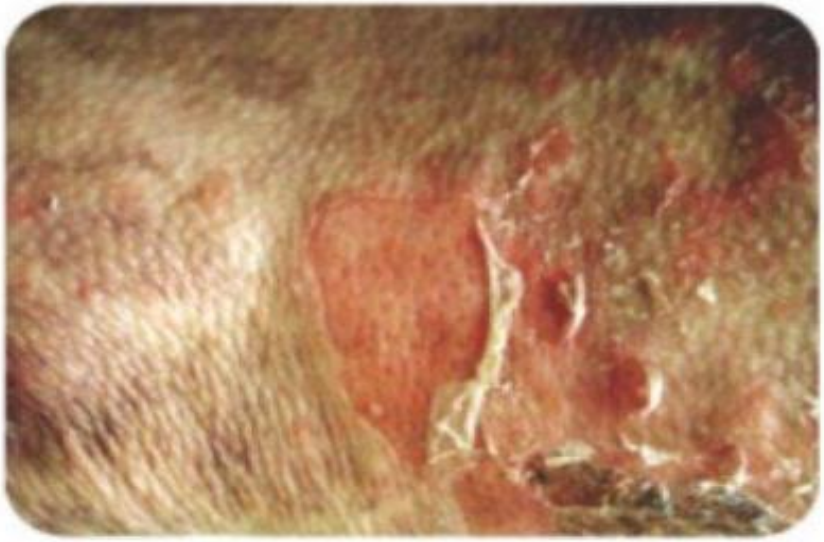

Figure 1-16 Erosion. Pemphigus foliaceus on the central chest.

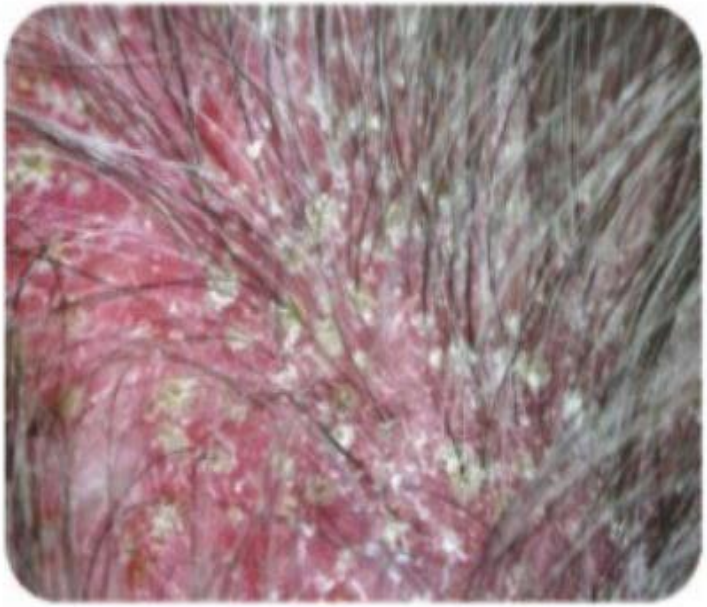

Figure 1-8 Pustule. Pustular psoriasis of the scalp.

Figure 1-14 Atrophy. Cutaneous lichen sclerosus.

Figure 1-15 Hypertrophy. Hypertrophic actinic keratosis on the forehead.

Figure 1-9 Wheal. Urticarial plaque, note follicular accentuation.

Figure 1-10 Burrow. Scabies burrow on the finger.

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Figure 1-17 Ulceration. Chronic ulceration on the arm, possibly self-inflicted.

Figure 1-18 Scar. Scar 1 year after Coumadin necrosis on thigh.

Figure 1-19 Lichenification. Lichenification and skin erosions due to allergic dermatitis.

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Figure 1-21 Fissure. Full-thickness fissure on the finger secondary to hand eczema.

Figure 1-27 Annular. Granuloma annulare.

Figure 1-38 Herpes zoster on the trunk.

Primary Skin Lesions

10 followers

nodule

cyst

bullae

macule

plaque

wheal

vesicle

pustule